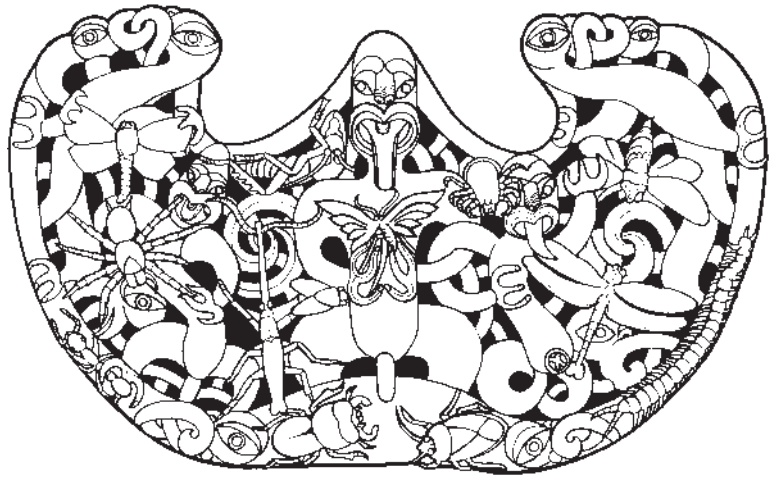


Fauna of New Zealand

Ko te Aitanga Pepeke o Aotearoa

Larivière, M.-C.; Fletcher, M. J.; Larochelle, A. 2010: Auchenorrhyncha (Insecta: Hemiptera): catalogue. *Fauna of New Zealand 63*, 232 pp.

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Fauna of New Zealand
Ko te Aitanga Pepeke o Aotearoa

Number / Nama 63

Auchenorrhyncha

(Insecta: Hemiptera): catalogue

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with colour photographs by B. E. Rhode

Manaaki Whenua PRESS

Lincoln, Canterbury, New Zealand
2010

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Cataloguing in publication

Larivière, Marie-Claude
Auchenorrhyncha (Insecta: Hemiptera) : catalogue / M.-C. Larivière, M. J. Fletcher and A. Larochelle ; with colour photographs by B. E. Rhode. – Lincoln, Canterbury, N.Z. : Manaaki Whenua Press, 2010.
(Fauna of New Zealand, ISSN 0111-5383 (print), ISSN 1179-7193 (online) ; no. 63).
ISBN 978-0-478-34720-3 (print)
ISBN 978-0-478-34721-0 (online)

I. Fletcher, M. J. II. Larochelle, André, 1940 Apr. 10– III. Title IV. Series

UDC 595.753

Suggested citation:

Larivière, M.-C.; Fletcher, M. J.; Larochelle, A. 2010. Auchenorrhyncha (Insecta: Hemiptera): catalogue. *Fauna of New Zealand 63*, 232 pp.

Prepared for publication by the series editor and the authors using computer-based text processing, layout, and printing at Landcare Research, Private Bag 92170, Auckland, New Zealand. Colour photographs prepared by Dr B. E. Rhode using a 3-CCD colour video camera, software to increase depth-of-field, and the photoprocessing software PhotoShop®

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Māori text by H. Jacob, Ōtaki.

Published by Manaaki Whenua Press, Landcare Research, P.O. Box 40, Lincoln, Canterbury, N.Z.
Website: http://www.mwpress.co.nz/

Printed by PrintLink Ltd, Wellington

Date of publication 16 June 2010

Front cover: *Thanatodictya tillyardi* Myers, family Dictyopharidae (Illustrator: D. W. Helmore).

Publication of the *Fauna of New Zealand* series is the result of a research investment by the Foundation for Research, Science and Technology.

POPULAR SUMMARY

Class **Insecta**

Order **Hemiptera**

Suborder **Auchenorrhyncha**

Cicadas, leafhoppers, planthoppers, and allies (Auchenorrhyncha)

The Auchenorrhyncha are generally regarded as a suborder of the Hemiptera. They include planthoppers, cicadas, froghoppers, spittlebugs, treehoppers, and leafhoppers. These insects are highly diverse and form a major component of the plant-feeding fauna of most terrestrial ecosystems. Auchenorrhyncha have adopted varied life habits on nearly all continents and islands (except Antarctica) and there may be around 42 000 species described worldwide. The world fauna is divided into roughly 30 to 40 families. The number of species of better known continental faunas such as North America, Europe or Australia may include thousands of species. Compared with these larger regions the New Zealand fauna – currently comprising 12 families, 68 genera and 196 species – may appear relatively small but what it lacks in size it makes up for in uniqueness, e.g., 82% of known species do not occur anywhere else in the world. From this point of view New Zealand can be regarded as a biodiversity "hot spot" for this group of insects. New genera and species will be discovered in the future and once fully described the New Zealand fauna may reach 300 to 350 species.

Auchenorrhyncha can be distinguished from other Hemiptera suborders on the basis of three main characteristics: sucking mouthparts in the form of a beak extending from the back of the head – the name Auchenorrhyncha literally means "neck-beaks"; relatively short and bristle-like antennae; and forewings of uniform texture (entirely membranous or leathery) resting rooflike over the abdomen.

In this volume, four questions most commonly asked about a group of insects are being answered: What, where, when and how? What Auchenorrhyncha occur in New Zealand, what is their status (e.g., native, introduced from elsewhere, pests, disease vectors)? What are the resources available to identify and study them? Where do species and genera occur (e.g., geographic distribution in New Zealand and overseas, habitats, dispersal abilities)? When are they active (e.g., seasonal activity, mating, egg-laying, wintering)? How do they live (e.g., food preferences, hostplants, natural enemies)?

New Zealand Auchenorrhyncha are generally active during the day and live in lowland to mountain forests and shrublands, although a number of groups are typically found in more open habitats, such as tussock grasslands, and in subalpine environments. Native species usually live within the confines of their natural habitats but some species also live in modified ecosystems and exotic tree plantations. Depending on families and genera, species can be predominantly active on low plants, trees and shrubs, or even the ground surface. Hostplants are known for less than 20% of species. The recognisable features and biology of the immature stages (nymphs) are unknown for the majority of species. Anecdotal evidence suggests that parasitic wasps, birds, predatory beetles, spiders, and mites may be among the major natural enemies of New Zealand Auchenorrhyncha. Overall, about 25% of the fauna is short-winged or wingless. Active dispersal by flight is therefore unlikely for these species.

(continued overleaf)

HE WHAKARĀPOPOTOTANGA

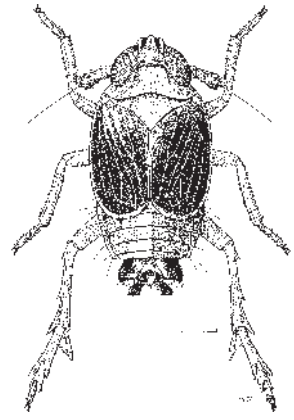


Illustration / Whakaahua: *Sulix tasmani* (Muir), family Delphacidae (Illustrator / Kaiwhakaahua: D. W. Helmore).

Ngā kihikihi, ngā peke-rau, ngā peke-tipu, me ō rātou uri tata (arā, a ngāi Auchenorrhyncha)

E whakaaetia nuitia ana he pūtoi-iti a ngāi Auchenorrhyncha nō ngāi Hemiptera. Kei tēnei karangatanga ngā ngārara peke-tipu, ngā kihikihi, ngā peke-poraka, ngā pītara-tuha, ngā peke-rākau, me ngā peke-rau. He matahuhua tonu te rōpū nei, ā, ko rātou tētahi wāhanga nui o ngā hanga ora kai tipu o ngā pūnaha hauropi noho papa. He maha ā rātou urutaunga taha whanonga i ngā whenua me ngā moutere katoa (hāunga anō Te Kōpakatanga ki te Tonga), ā, e whakapaetia ana kei te āhua 42 000 ngā momo i ngā tini kokonga o te ao, kua oti te whakaahua ā-kupu. Nō ngā whānau e 30–40 ēnei momo. Tērā pea kei ngā mano ngā momo o ētahi o ngā taupori e kaha ake ana te mōhiotia, pērā i ērā o Amerika ki te Raki, o Ūropi, o Ahitereiria. Ina whakatairitea ngā mea o konei ki ērā, he huinga iti tonu, inā rā, 12 ngā whānau, e, 68 ngā puninga, 196 ngā momo. Engari ahakoa iti, he pounamu. Inā rā, ko tētahi 82% o ngā momo o konei e mōhiotia ana, kāore i whenua kē. Nā reira me kī pēnei ake, he wāhi whakahirahira a Aotearoa mō te matahuhua-koiora o tēnei karangatanga pepeke. Kāore e kore ka kitea he puninga anō, he momo anō ā tōna wā, ā, ina oti te whakaahua ā-kupu, tērā ka piki te maha o ngā momo ki te 300–350.

E toru ngā āhuatanga matua e noho wehe ai ngā Auchenorrhyncha i ērā atu pūtoi-iti o ngāi Hemiptera: ko ngā wāhanga ngote o te waha – arā, he ngutu e toro ana atu i te murikōkai — ko te tikanga hoki o te ingoa Auchenorrhyncha, ko te "ngutu-kakī"; ko te poto o ngā pūhihi — me te tarakina te rite; kotahi anō te kakano o ngā parihau o mua (he kiriuhi katoa, he kirikau katoa rānei) e noho 'tuanui' mai ana ki te puku.

I tēnei putanga, ka whakautua ngā momo pātai e whā e uia nuitia ana mō ngā aitanga pepeke, koia ēnei: he aha, kei hea, āhea, pēhea? He aha ngā Auchenorrhyncha kei Aotearoa e noho ana, he aha ō rātou tūranga (e.g., he momo māori, he rāwaho, he momo takakino, he whakawhiti tahumaero)? He aha ngā rauemi e wātea ana hei tautohu, hei rangahau i ngā pepeke nei? Kei hea ake ngā momo me ngā puninga (e.g., i Aotearoa, i tāwāhi, ngā kāinga noho, te kaha ki te whakapīrara haere)? Āhea ka kori ake (e.g., ngā koringa ā-kaupeka, te whakaputa uri, te whānau hua, te āhua i te takurua)? He pēhea te āhua o te noho (e.g., ngā tino kai, ngā tipu ka āta nohoia, ngā hoariri māori)?

(haere tonu)

The described New Zealand fauna, with 196 species, is about 13% the size of the known Australian fauna which has around 1500 species. Currently, 15 families of Auchenorrhyncha occurring in Australia are not found in New Zealand. The number of recognised introduced species in New Zealand is currently 24, or about 12% of the total fauna. No family is endemic to (exclusively occurring in) New Zealand but all ground-dwelling leafhoppers (family Myerslopiidae) are endemic, accounting for 70% of world species in this group. The three largest families in New Zealand are the leafhoppers or Cicadellidae (78 species or 40% of the fauna), cicadas or Cicadidae (34 species or 17%), and cixiid planthoppers or Cixiidae (26 species or 13%). These families are also well represented in Australia

Most species shared with Australia and other parts of the world are cosmopolitan and probably introduced. Native species shared with regions neighbouring New Zealand are mostly in common with eastern continental Australia, to a lesser degree with Tasmania and Norfolk Island, and in some instances with Lord Howe Island and New Caledonia. Such faunal affinities may be indicative of an old Gondwanan origin. As in many parts of the world the family Cicadellidae (leafhoppers) is taxonomically diverse and this is where most faunal affinities are observed, followed by the family Delphacidae (delphacid planthoppers). At the generic level New Zealand shares 40% of its native genera with Australia (as including Tasmania, Norfolk Island, Lord Howe Island), or 20 out of 50 native genera. At the species level this is approximately 5%.

The species distribution maps provided show most species to be more widely distributed in New Zealand than previously thought. Even well-studied species occur in more areas of the country than previously recognised. Nevertheless, roughly 95 native species, or 55% of the entire native fauna, are known from ten populations or fewer. These populations are of potential interest to insect conservation.

A greater number of species (133) occur on the South Island and 64 native species are restricted to this island. A slightly lower number of species (119) occur on the North Island, including 44 native species restricted to this island. As many as 65 taxa are shared between the North and the South Island. Offshore island groups are known to harbour a limited number of native species: Chatham Islands (12), Kermadec Islands (10), Three Kings Islands (21). Auchenorrhyncha have never been recorded from New Zealand's subantarctic islands (Antipodes, Aucklands, Bounties, Campbell Island or Snares).

On New Zealand's main islands, the areas so far known to contain the highest diversity are the Northland, Auckland, and Wellington regions on the North Island, and the Northwest Nelson and Mid Canterbury regions on the South Island. However, some of these regions contain many species introduced from Australia and elsewhere. For the biologist, the areas known to have the greatest number of local endemics – species only found in a single region of New Zealand and nowhere else in the world – are the most interesting. This is the case of the Northland and Wellington regions on the North Island, and the Northwest Nelson, Marlborough, Mid Canterbury, Fiordland and Southland regions on the South Island. The largely unexplored and unspoilt area of Fiordland is likely to provide an even greater reservoir of endemism than currently estimated.

The regions with the largest number of introduced species are relatively warm parts of New Zealand as well as its main trading ports or agricultural areas (Auckland, Hawkes Bay, Nelson, Christchurch). Many introduced species have fully developed wings and good dispersal abilities, some are attracted to artificial lights, and most can adapt well to living in highly or partly modified environments.

(continued overleaf)

Ko te nuinga o ngā Auchenorrhyncha o Aotearoa, he kori awatea. Kitea ai i ngā ngahere me ngā wāhi ururua mai i ngā whenua hakahaka, piki atu ki ngā maunga, otirā ko ētahi kei te takiraha, kei ngā whenua pātītī, me ngā taiao āhua mārakerake i ngā maunga. Ko te nuinga o ngā momo māori, ka noho whāiti ki ō rātou rīpoinga māori tūturu. Engari ko ētahi e noho ana i ngā pūnaha hauropi kua raweketia e te tangata, tae atu ki ngā papa whakatipu rākau rāwaho. Ahakoa he rerekē ia whānau, ia puninga, kitea nuitia ai ngā momo e kawe ana i ā rātou mahi i ngā tipu me ngā rākau poto, i te papa tonu rānei. E 20% noa iho ngā momo e mōhiotia ana ngā tipu e piri atu ai rātou. Waihoki, mō te nuinga o ngā momo, kāore e mōhiotia ana ngā āhuatanga tāpua me te koiora o ngā punua. E ai ki ngā taunakitanga āwaha, ko ētahi o ngā hoariri māori matua o ngā Auchenorrhyncha o Aotearoa, ko ngā wāpu pirinoa, ngā manu, ngā pītara konihi, ngā pūngāwerewere, me ngā pūwerewere. Hui katoa, ko tōna 25% o te rōpū whānui nei he poto ngā parihau, karekau rānei he parihau. Nō reira ehara pea ko te rere tētahi ara e pīrara haere ai ēnei momo.

Kotahi rau, e iwa tekau mā ono ngā momo o Aotearoa kua oti te āta whakaahua ā-kupu. Ko tētahi 13% tēnei o te rahi o ngā momo o Ahitereiria — kei te takiwā o te 1500 ngā momo o reira. I tēnei wā, 15 ngā whānau Auchenorrhyncha kei Ahitereiria kāore e kitea i Aotearoa. E 24 ngā momo rāwaho kei Aotearoa e noho ana — he tata tēnei ki te 12% o ngā momo katoa. Karekau he whānau kotahi ko Aotearoa anake te whenua e noho ai ōna momo katoa, engari katoa ngā peke-rau noho papa (o te whānau Myerslopiidae) nō konei anake, ā, koia tētahi 70% o ngā momo katoa o tēnei rōpū, puta noa i te ao. Ko ngā whānau rahi katoa i Aotearoa, ko ngā peke-rau, a ngāi Cicadellidae (e 78 ngā momo, ko tētahi 40% tēnei o te rōpū nui tonu), ngā kihikihi, a ngāi Cicadidae (e 34 ngā momo, ko tētahi 17% tēnei), me ngā peke-tipu cixiid, a ngāi Cixiidae (e 26 ngā momo, ko tētahi 13%). Heoi anō, kitea nuitia ai ēnei whānau i Ahitereiria anō hoki.

Ko te nuinga o ngā momo e noho ana ki Aotearoa me Ahitereiria, kei ngā wāhi katoa o te ao, ā, i tatū mai pea ki konei i wāhi kē. Ko te nuinga o ngā momo māori kei Aotearoa me ōna kiritata, ka kitea anō i te rāwhiti o Aotearoa, ā, he iti ake ka kitea anō i Tahimania, i te Moutere Norfolk, ā, he torutoru ka kitea anō i te Moutere o Lord Howe me te Whenua Kanaki. Ko Te Uri Māroa pea te pūtakenga mai o ēnei āhuatanga ōrite. Pērā anō i ngā tōpito huhua o te ao, he whānau matahuhua tonu a ngāi Cicadellidae (ngā peke-rau), ā, kitea nuitia ai ngā āhuatanga ōrite o roto i tēnei rōpū. Muri iho, ko te whānau Delphacidae (ngā peke-tipu delphacid). E 20 o roto i te 50 (ko tētahi 40%) o ngā puninga o Aotearoa, kei Ahitereiria anō (tae atu ki Tahimania, te Moutere Norfolk, me te Moutere o Lord Howe). Kia heke ki te papanga momo, e 5% tēnei.

E kitea ana i ngā mahere whakaatu i te tītaringa o ngā momo, kua whānui ake te hora o te nuinga o ngā momo i tērā i whakapaetia. Me te hāngai anō o tēnei kōrero ki ngā momo kua rangahautia nuitia. Heoi anō, e 95 pea ngā momo māori (ko tētahi 55% tēnei o ngā momo māori katoa) kei ētahi taupori tekau, iti ake rānei. E tika ana pea kia tirohia ēnei taupori i raro i ngā kaupapa whāomoomo i ngā aitanga pepeke.

He maha ake ngā momo (133) kei Te Waka-a-Māui, ā, e 64 o ēnei kāore e kitea i moutere kē. He paku iti ake (119) ngā momo kei Te Ika-ā-Māui, a, e 44 o ēnei kāore e kitea i moutere kē. Kua eke pea ki te 65 ngā rōpū kei Te Ika me Te Waka-a-Māui. Kei ētahi o ngā huinga moutere o waho ētahi momo māori torutoru nei. Ko Wharekauri tērā (12), ko ngā Moutere Kermadec (10), me Manawatāwhi (21). Kāore anō kia kitea he Auchenorrhyncha i ngā moutere ahu atu ki Te Kōpakatanga ki te Tonga (arā, ki ngā Antipodes, ki ngā Moutere o Auckland, o Bounty, te Moutere o Campbell, ki Snares rānei).

(haere tonu)

Contributor **Marie-Claude Larivière** was born and educated in Québec, graduating with a PhD in systematic entomology from McGill University in 1990. For the following two years she did postdoctoral research at Agriculture Canada, Ottawa. In 1992, Marie-Claude moved to New Zealand to work as a full-time Hemiptera biosystematist with Landcare Research. From 1994 to 1997 she led the Biosystematics of New Zealand Land Invertebrates programme, from 1995 to 2005 the development of New Zealand Arthropod Collection's databasing and digital imaging systems, from 1999 to 2004, the Koiora-BioAssist™ project (Biodiversity Assessment using Information Technology and Taxonomy), and from 2007 to 2010, the Invertebrate Biosystematics research group (Landcare Research, Auckland). Marie-Claude has been an active member of the *Fauna of New Zealand* series committee (1994–2004, 2007–present). She is the author of over 90 papers and monographs on the taxonomy, distribution and natural history of Hemiptera and Carabidae (Coleoptera), including seven *Fauna of New Zealand* contributions (Hemiptera: Auchenorrhyncha catalogue, Heteroptera catalogue, Cixiidae and Pentatomoidea revisions; Carabidae: taxonomic catalogue; Harpalini revision; synopsis of supraspecific taxa). She has also published on Australian and South Pacific Hemiptera as well as on North and Central American Hemiptera, Orthoptera, and Carabidae. Many of her publications have been written in collaboration with her husband André Larochelle with whom she hopes to soon publish new works on New Zealand Hemiptera and Carabidae. In addition, she conducts international cooperative research and New Zealand-based commercial research for the Crown Research Institute Landcare Research. Marie-Claude has a keen interest in biological information technology, especially digital taxonomy, computer imaging, interactive identification, and web-publishing. She maintains electronic information on Hemiptera on The New Zealand Hemiptera website (http://hemiptera.landcareresearch.co.nz/). Since 1992 she has been actively involved in specialised field inventory, surveying Hemiptera in over 1000 localities, to gain a better understanding of the taxonomy, natural history, and biogeography of New Zealand species.

Contributor **Murray Fletcher** was born in Adelaide, South Australia, but received most of his education in Sydney, where he graduated from Sydney University with BSc (Hons) in 1974 and PhD in 1978. Dr John W. Evans was an early mentor and encouraged him to focus on the planthoppers (Fulgoromorpha) for both his PhD project and his subsequent life's work. In 1986, Evans passed his extensive reprint collection into Murray's care. Murray had begun work as an insect taxonomist with the then NSW Department of Agriculture (later the NSW Department of Primary Industries) at the Biological and Chemical Research Institute (BCRI) at Rydalmere in Sydney's west in May 1977. Murray's initial focus was on the planthopper family Flatidae and in 1986, he expanded his interests to include the leafhoppers (Auchenorrhyncha: Cicadomorpha) of Australia. He has published more than 80 papers on these groups of insects, many with international collaborators, as well as over 30 electronic publications, particularly identification keys to the fauna of Australian and neighbouring areas on the ASCU website (http://www1.dpi.nsw.gov.au/keys/). In 1997, BCRI was closed and the entomological and plant pathology collections and associated staff were relocated to Orange Agricultural Institute in the Central West of New South Wales where they are still located. Murray is now a Principal Research Scientist and Research Leader (Scientific Collections). He is also an Adjunct Professor with Charles Sturt University, Subject Editor (Fulgoromorpha) for *Zootaxa* and a member of the Editorial Boards for *Fauna of New Zealand, Entomotaxonomia, Australian Journal of Entomology,* and *General and Applied*

(continued overleaf)

I te tuawhenua o Aotearoa, ko ngā wāhi e mōhiotia ana kei reira te tino matahuhuatanga, ko Te Tai Tokerau, ko Tāmaki, me Te Upoko-o-te-Ika i Te Ika-a-Māui, ko te rohe uru-mā-raki o Whakatū, ko ngā whenua waenga o Waitaha i Te Waipounamu. Heoi, he maha anō ngā momo rāwaho o Ahitereiria, o hea ake kei aua takiwā. Ki te tohunga koiora, ko ngā wāhi e tino nui ai ngā momo kāore e kitea i wāhi kē o Aotearoa, o te ao rānei, koia kē ngā wāhi tino whai take hei rangahau. Koinei te āhua ki Te Tai Tokerau, ki Te Upoko-o-te-Ika, i Te Ika-a-Māui, me te rohe uru-mā-raki o Whakatū, a Wairau, te rohe waenga o Waitaha, a Piopiotahi, me Murihiku i Te Waipounamu. Ā, kāore e kore ko Piopiotahi me ōna whenua urutapu kāore anō kia kaha pōkaihia e te tangata, koia tētahi wāhi ka nui atu ōna momo pērā.

Ko ngā rohe kei reira te maha atu o ngā momo rāwaho, ko ngā wāhi āhua mahana ake o Aotearoa, ko ngā tumu waka hokohoko matua, me ngā wāhi ahuwhenua nui (ko Tāmaki, ko Te Matau-a-Māui, ko Whakatū, ko Ōtautahi). He maha ngā momo rāwaho e pakari ana ngā parihau, e āhei pai ana ki te whakapīrara haere. Ko ētahi ka whakawaia e te aho horihori, ā, ko te nuinga, ka urutau pai noa iho ki ngā taiao kua āhua rawekehia, kua kaha tonu rānei te rawekehia.

I whānau mai tētahi o ngā kaituhi, a **Marie-Claude Larivière** i Québec. I reira anō ia e rapu ana i te mātauranga ā, riro noa i a ia tana Tohu Tākutatanga mai i te Whare Wānanga o McGill, i te tau 1990. Ko te kaupapa o taua tohu, ko te pūnaha whakarōpū i ngā aitanga a Punga. Kātahi ia ka neke ki Agriculture Canada, i Ottawa, mō te rua tau, ki reira whātoro ai i ētahi atu rangahautanga. Nō te tau 1992, ka neke mai a Marie-Claude ki Aotearoa, ka mahi hei kaitātai i ngā whakapapa o ngāi Hemiptera mā Manaaki Whenua. Mai i te 1994 ki te 1997, nāna i ārahi te Tātaitanga o ngā Whakapapa o ngā Aitanga Tuarā-Kore a Tāne, te hanganga o ngā pūnaha pātengi raraunga, whakaahua ā-mati mō te Kohinga Angawaho o Aotearoa, ā, mai i te tau 1994 ki te 2004, ko te kaupapa Koiora-BioAssist™ (Te Aromatawai i te Huhuatanga Koiora i runga i te Whakamahi i te Hangarau Mōhiohio me te Whakarōpūtanga). Mai i te Hōngongoi 2007 ki te 2010, ko ia anō te kaiārahi o te rōpū rangahau i te Tātaitanga o ngā Whakapapa o ngā Hanga Tuarā-Kore (i Manaaki Whenua, Tāmaki). Me kōrero anō te wāhi ki a ia i te komiti whakataki i te hautaka *Ko te Aitanga Pepeke o Aotearoa* (1994–2004, 2007–nāianei). He neke atu i te 90 ngā tuhinga kua oti i a ia e pā ana ki te whakarōpūtanga, te tītaringa, me ngā hītori māori o ngāi Hemiptera me Carabidae (Coleoptera), tae atu ki ētahi tānga e 7 mō *Ko te Aitanga Pepeke o Aotearoa* (a Hemiptera — he rārangi Auchenorrhyncha, he rārangi Heteroptera, he whakahoutanga mō ngāi Cixiidae me Pentatomoidea; ngā Carabidae — he rārangi whakarōpū; a Harpalini — he whakahoutanga; he whakarāpopototanga o ngā rōpū o runga ake i te momo). Kua puta anō i a ia he tuhinga mō ngā Hemiptera o Ahitereiria me Te Moana-nui-a-Kiwa, tae atu ki ētahi mō ngāi Hemiptera, ngāi Orthoptera, me ngāi Carabidae i Amerika ki te Raki me Amerika Pū. He maha tonu ana tuhinga kua tuhia ngātahitia ki tana hoa tāne, ki a André Larochelle, ā, ko tana tūmanako, taihoa ka whakaputaina e rāua ētahi kōrero hou mō ngā Hemiptera me ngā Carabidae o Aotearoa. Āpiti atu ki tērā, kei te whakahaere ia i ētahi rangahautanga mahi tahi ki ētahi atu kaimātai pepeke o te ao, ko ia anō tērā ki te ārahi i ētahi rangahau arumoni i Aotearoa mā Manaaki Whenua. Tērā anō tētahi tino kaupapa e whāia ana e Marie-Claude, ko te hangarau pārongo koiora, tae atu ki te whakarōpū ā-mati, te hanga whakaahua ki te rorohiko, te tautohu pāhekoheko, me te whakaputa kōrero ki te pae tukutuku. Ko ia kei te tiaki i ngā kōrero rorohiko mō ngāi Hemiptera i te pae tukutuku mō ngā Hemiptera o Aotearoa (http://hemiptera.landcareresearch.co.nz/). Mai i te tau 1992, kua

(haere tonu)

Entomology. He is chair of the Standing Committee for International Auchenorrhyncha Congresses and editor of the *Tymbal* Auchenorrhyncha website. From 2004–2008 he was Vice President and Chairman of the Executive of the Australian Entomological Society and continues on the Society's Council as Regional Councillor for rural NSW. He has supervised or co-supervised numerous postgraduate projects and is currently supervising three PhD projects, two of which are being undertaken by students at the North West Agriculture and Forestry University, Yangling, China.

Contributor **André Larochelle** was born and educated in Québec, graduating in 1974 with a Brevet d'Enseignement spécialisé from the Université du Québec à Montréal. He taught ecology at the Collège Bourget, Rigaud, Québec, until 1990. With the encouragement of the late carabid specialist Carl H. Lindroth, André very quickly became interested in the study of ground-beetles. From 1975 to 1979 he was the co-editor of two entomological journals, *Cordulia* and *Bulletin d'inventaire des insectes du Québec*. From 1986 to 1992, he was honorary curator to the Lyman Entomological Museum and Research Laboratory, McGill University, Québec. In 1992, André moved to New Zealand to work as a research scientist. Currently, he is a Research Associate with the New Zealand Arthropod Collection, Landcare Research, Auckland. André has written over 400 papers on the distribution, ecology, biology, and dispersal power of North American carabids and other insects (including two handbooks on the Heteroptera of Québec). In 1990 he published "The food of carabid beetles of the world"; in 1993, with Yves Bousquet, he co-authored a "Catalogue of Carabidae of America North of Mexico"; and in 2001 and 2003, with his wife Marie-Claude, he published a "Natural History of the tiger beetles of North America North of Mexico" and "A Natural History of Carabidae" for the same region. His currrent main research interests are the faunistics and taxonomy of New Zealand ground-beetles on which he has co-authored three *Fauna of New Zealand* contributions (Catalogue of Carabidae, 2001; Revision of tribe Harpalini, 2005; Synopsis of supraspecific taxa, 2007). André is a keen provider of electronic information on ground-beetles on the internet via The New Zealand Carabidae website (http://carabidae.landcareresearch.co.nz/). Since 1992, he has been actively involved in specialised field inventory, surveying carabids in over 1000 localities, to gain a better understanding of the taxonomy, natural history, and biogeography of New Zealand species.

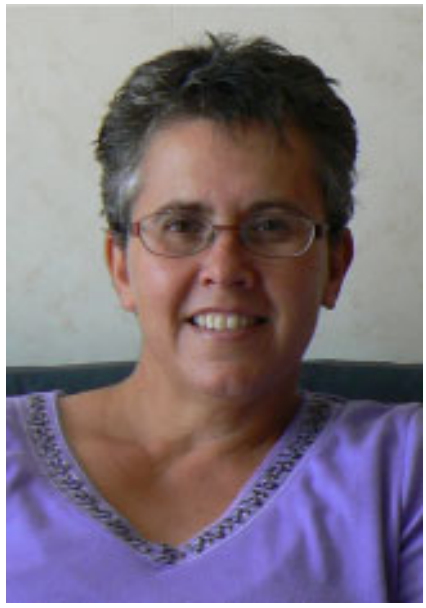
Birgit E. Rhode was born and educated in Germany where she graduated with a PhD in marine biology from the University of Hamburg in 1987. Between 1980 and 1993 she worked in estuarine and coastal marine ecology (Institute of Hydrology, Island of Norderney, North Sea), studied the developmental morphology of polychaete sense organs, and lectured in general zoology and marine biology (Zoological Institute, Free University of Berlin). In 1993, Birgit moved to New Zealand. Always open to new challenges, she abandoned the marine environment and moved on to drier grounds becoming a Research Assistant to Marie-Claude Larivière's work on New Zealand Hemiptera. Birgit has always been fascinated with photography and structural details, so it was almost inevitable that with the introduction of digital imaging into the research environment she became more and more involved in imaging and graphics work. She is now fulfilling most of the imaging requirements of entomological systematists at Landcare Research.

whakapau kaha ia ki te puta ā-tinana atu ki te taiao ki te āta tirotiro i ngā Hemiptera i ngā takiwā 1000 neke atu, e mārama ake ai ngā whakarōpūtanga, ngā hītori māori, me te papawhenua-koiora o ngā momo o Aotearoa.

I whānau mai te kaituhi nei, a **Murray Fletcher**, ki Atareta, i Ahitereiria ki te Tonga, engari i kuraina ki Poihākena. He mea whakawhiwhi ia e te Whare Wānanga o Poihākena ki tana Tohu Pūtaiao (Hōnore) i te tau 1974, ā, ki tana Tohu Kairangi i te tau 1978. Ka poipoia ia e Tākuta John W. Evans, nāna a Murray i akiaki kia arotahi ki ngā peke-tipu (a ngāi Fulgoromorpha) mō tana Tohu Kairangi, ā haere ake. I te tau 1986, ka tukuna e Evans tana kohinga tāruatanga nui tonu hei tiaki mā Murray. Kua tīmata kē a Murray i tana mahi whakarōpū pepeke i te Tari o NSW i tērā wā (nō muri mai ka riro ko te Tari Ahumahi Mātāmua o NSW te ingoa) i te Pūtahi Rangahau Koiora, Matū (BCRI) i Rydalmere, rohe o Poihākena ki te uru, i te Haratua o te tau 1977. Ko tana aronga i te tīmatanga, ko te whānau peke-tipu Flatidae. Nō te tau 1986, ka pere atu anō te titiro ki ngā peke-rau (Auchenorrhyncha: Cicadomorpha) o Ahitereiria. He nui ake i te 80 ngā kōrero kua tāia e ia mō ēnei huinga pepeke, ko ētahi i mahia tahitia ki ngā tohunga o tāwāhi, ā, he neke atu i te 30 ngā tānga ā-rorohiko, ko te maha atu o ēnei he ara tautohu mō ngā pepeke o Ahitereiria me ngā moutere piritata, ki te pae tukutuku ASCU (http://www1.dpi.nsw.gov.au/keys/). I te tau 1997, ka kati te BCRI, ka nekehia ngā kohinga mātai pepeke, mātai mate tipu, me ōna anō kaimahi, ki te Pūtahi Ahuwhenua Ārani i te Pokapū-mā-Uru o Niu Taute Wēra. He Kaipūtaiao Rangahau Matua, he Kaiārahi Rangahau (Kohinga Pūtaiao) a Murray iāianā. Ko ia anō tētahi Ahorangi Turuki i te Whare Wānanga o Charles Sturt, he ģtita Kaupapa (Fulgoromorpha) mā *Zootaxa,* he mema anō nō ngā Poari Āhuatanga ģtita mō *Ko te Aitanga a Pepeke*, te *Entomotaxonomia*, te *Australian Journal of Entomology* me te *General and Applied Entomology*. Ko ia te tumuaki o te Komiti Tū mō ngā Hui Auchenorrhyncha o te Ao, me te ētita o te pae tukutuku mō ngā Auchenorrhyncha *Tymbal*. I ngā tau 2004–2008, ko ia te Perehitene Tuarua me te Tumuaki o te Komiti Whāiti o te Kāhui Mātai Pepeke o Ahitereiria, ā, e noho tonu nei ia ki te Kaunihera a te Kāhui hei Pou Kaunihera ā-Rohe mō te taiwhenua o Niu Taute Wēra. E hia kē ngā kaupapa paerua ko ia te kaiārahi; i tēnei wā e toru ngā kaupapa tohu kairangi e arahina ana e ia. E rua o ēnei e whakahaeretia ana e ētahi ākonga i te Whare Wānanga Ahuwhenua, Ono Rākau ki te Uru-mā-Raki, i Yangling, Haina.

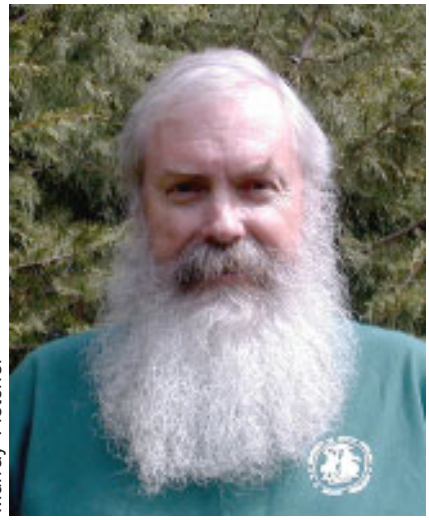
I whānau mai tērā atu kaituhi, a **André Larochelle**, i Québec. I reira ia e kura ana, ā, nō te tau 1974 ka whakawhiwhia ki tana tohu Brevet d'Enseignement spécialisé, mai i te Whare Wānanga o Québec ki Montréal. Taka mai ki te tau 1990, e whakaako ana ia i te mātai hauropi i te Kura Bourget, i Rigaud, Québec. Kāore i roa e whakaako ana, ka tupu tana hiahia ki te rangahau pītara noho papa, me te poipoi anō a tērā tohunga carabid kua riro nei i te tirohanga kanohi, a Carl H. Lindroth, i tēnei whakaaro ōna. Mai i te 1975 ki te 1979 ko ia tētahi o ngā ētita o ētahi hautaka mātai pepeke, arā, o *Cordulia* me te *Bulletin d'inventaire des insectes du Québec*. Mai i te 1986 ki te 1992, ko ia te kaitiaki hōnore o te Whare Rokiroki, Rangahau Pepeke o Lyman, i te Whare Wānanga o McGill, i Québec. I te tau 1992, ka neke mai a André ki Aotearoa, ka mahi hei kaipūtaiao rangahau. I tēnei wā, he Kairangahau ia i te Kohinga Angawaho o Aotearoa i Manaaki Whenua, Tāmaki-makau-rau. He nui ake i te 400 ngā kōrero kua tuhia e André mō te tītaringa, ngā āhuatanga hauropi, te koiora, me te kaha whakapirara o ngā carabid me ētahi atu aitanga pepeke o Amerika ki te Raki (tae atu ki ētahi pukapuka ringa mō ngā Heteroptera o Québec). I te tau 1990, ka

(haere tonu)



Marie-Claude Larivière

whakaputaina e ia "Ngā kai a ngā pītara carabid o te ao"; i te tau 1993, ko rāua ko Yves Bousquet ngā kaituhi i te "Rārangi o ngā Carabidae o Amerika ki te Raki o Mēhiko"; i te tau 2001 me te 2003, nā rāua ko tana wahine, a Marie-Claude, i whakaputa ngā "Hītori Māori o ngā tātaka o Amerika ki te Raki, ki te Raki o Mēhiko" me ngā "Hītori Māori o ngāi Carabidae", mō taua rohe anō. Ko te aronga matua o ana mahi rangahau i ēnei rā, ko te āhua me te whakarōpūtanga o te whānau pītara noho papa o Aotearoa. E toru ngā tuhinga *Ko te Aitanga Pepeke o Aotearoa* ko ia tētahi o ngā kaituhi (ko te Rārangi o ngāi Carabidae, 2001; he whakahoutanga o te iwi Harpalini, 2005; he whakarāpopototanga o ngā rōpū o runga ake i te momo). He kaha ia ki te uta kōrero atu e pā ana ki ngā pītara noho papa ki te ipurangi, mā te pae tukutuku mō ngā Carabidae o Aotearoa (http://carabidae.landcareresearch.co.nz/). Mai i te tau 1992, kua whakapau kaha ia ki te puta ā-tinana atu ki te taiao ki te āta tirotiro i ngā carabid i ngā takiwā 1000 neke atu, e mārama ake ai ngā whakarōpūtanga, ngā hītori māori, me te papawhenua-koiora o ngā momo o Aotearoa.



Murray Fletcher

Ko Tiamana te ūkaipō o **Birgit E. Rhode**, i kuraina anō ia ki reira. Nō te tau 1987 ka whakawhiwhia ia ki tana Tohu Tākutatanga koiora moana e te Whare Wānanga o Hamburg. Mai i te tau 1980 ki te 1993, ko ngā pūnaha hauropi o te wahapū me te takutai ētahi kaupapa i āta tirohia e ia (i te Pūtahi Mātai i ngā Wai o Papatūānuku, Moutere o Norderney, Moana Raki), ka tirohia anō te hanga o ngā wāhanga rongo o ngā noke polychaete, ā, he pūkenga anō ia mō te mātauranga kararehe whānui me te koiora moana (i te Pūtahi Mātauranga Kararehe, te Whare Wānanga Utu-kore o Berlin). I te tau 1993 ka neke mai a Birgit ki Aotearoa. He rawe ki te wahine nei ngā mātātaki hou. Whakarērea atu ana ngā mahi ki tai, tahuri mai ana ki uta, me te noho hei Kaiāwhina Rangahau mā Marie-Claude Larivière i āna mahi tirotiro i ngā Hemiptera o Aotearoa. He tino kaupapa pārekareka ki a ia te tango whakaahua me te hanga o ngā mea ora ā, i te urunga mai o ngā whakaahua ā-mati ki te ao rangahau, ka kaha ake tana whakapau kaha ki te tārai whakaahua me ngā mahi whakairoiro. Ināianei, ko ia kei te whakaea i te nuinga o ngā tono tārai whakaahua a ngā kaitātai whakapapa pepeke a Manaaki Whenua.



Birgit Rhode



André Larochelle

Translation by **H. Jacob**
Ōtaki



Frontispiece *Amphipsalta zelandica* (Boisduval) (Photograph: B. E. Rhode)

Dedication

"A recent catalogue of any kind, so long as it is reasonably complete on any particular side, is a gift of the gods." G.W. Kirkaldy, 1907, *Annales de la Société Entomologique de Belgique 51*: 303.

It would have been impossible to catalogue the New Zealand Auchenorrhyncha so comprehensively without the work of many researchers and collectors who studied the fauna before us. We take great pleasure in dedicating this work to two people in particular, William (Bill) Knight (formerly curator of Hemiptera, Natural History Museum, London) and the late John W. Evans (formerly Director of the Australian Museum, Sydney). The task of writing the catalogue would have been much more difficult without their previous efforts at revising the Auchenorrhyncha of New Zealand and Australia.

ABSTRACT

Auchenorrhyncha are a highly diverse group of hemimetabolous insects and a major component of the phytophagous insect fauna in most terrestrial ecosystems worldwide. They are treated here as a suborder of the Hemiptera and include the planthoppers (infraorder Fulgoromorpha), cicadas, froghoppers, spittlebugs, treehoppers, and leafhoppers (infraorder Cicadomorpha). With their piercing sucking mouthparts the majority of Auchenorrhyncha species feed on phloem or xylem (plant sap) or plant cell contents (parenchyma or cell ruptures) although some species feed on mosses or fungi. This economically important group includes several plant pests pests and several vectors of plant pathogens, including phytoplasmas, viruses, and bacteria.

Auchenorrhyncha have been collected extensively and are well represented in New Zealand entomological museums and collections. Despite this, no up-to-date catalogue has been published since Wise's (1977) "*... synonymic checklist of the Hexapoda of the New Zealand sub-region ...*" which enumerated 64 genera and 160 species in 11 families. Numerous nomenclatural changes and new taxa have been published since then, and the fauna now totals 68 genera and 196 species in 12 families.

In this biosystematics catalogue, the species-group names of all New Zealand Cicadomorpha and Fulgoromorpha are catalogued with distribution records and information on biology and wing condition (as indicative of flight ability). Valid names are listed in their current and original combinations with the author(s), publication date, page citation, type status, type repository, type locality, and biostatus. Synonyms are given in their original combinations. Other existing combinations are provided. Genus-group names are listed with the author(s), publication date, page citation, type species (including method of fixation), and biostatus. The catalogue is arranged alphabetically by infraorders, superfamilies, families, subfamilies, tribes, genus-group, and species-group names. Under each species, the geographic distribution, biology, and wing condition are given. Selected references dealing with taxonomy (including keys and revisions), distribution, biology, and dispersal power are also provided where appropriate.

The catalogue also includes a bibliography of over 500 references (including original taxonomic descriptions), colour photographs of 133 primary types deposited in New Zealand collections (covering about 68% of all described taxa), 207 maps showing species and subspecies distributions, four maps showing patterns of taxonomic diversity and species endemism, and a full taxonomic index. Finally, 8 appendices are provided: glossary, list of approximately 300 plants associated with Auchenorrhyncha, acronyms of entomological collections and museums, list of taxa incorrectly recorded or doubtfully established in New Zealand, geographical coordinates of over 380 collecting localities, alphabetical lists of valid taxa by areas of New Zealand, type localities of valid species described from New Zealand, and a list of about 95 taxa with limited distribution and which are of potential conservation importance. This catalogue brings together the available literature and collection-based information on New Zealand Fulgoromorpha and Cicadomorpha for use by biosystematists, identifiers, biosecurity and conservation managers, ecologists and other biologists, as well as members of the public.

The composition of the New Zealand auchenorrhynchan fauna and its affinities with Australia, Lord Howe Island, Norfolk Island, and New Caledonia are analysed and discussed. It is estimated that, once fully described, the fauna could total 300–350 species. Endemism is high with 81% of species and 41% of genera

currently recognised as being endemic; New Zealand is regarded as a biodiversity "hot spot". The fauna shows greatest affinity to that of eastern continental Australia. Twenty-four (24) adventive (introduced) taxa occur in New Zealand, including some economically important species, e.g., *Philaenus spumarius* (Linnaeus, 1758), Aphrophoridae; *Anzygina dumbletoni* (Ghauri, 1963), *Edwardsiana froggatti* (Baker, 1925), *Eupteryx melissae* Curtis, 1837, *Orosius argentatus* (Evans, 1938), *Ribautiana tenerrima* (Herrich-Schäffer, 1834), *Rhytidodus decimaquartus* (Schrank, 1776), Cicadellidae; *Anzora unicolor* (Walker, 1862), Flatidae; *Scolypopa australis* (Walker, 1851), Ricaniidae.

The following new combinations are made: *Arawa negata* (White, 1879) for *Athysanus negatus* White, 1879, *Nesoclutha phryne* (Kirkaldy, 1907) for *Nesoclutha pallida* (Evans, 1942) (Cicadellidae); *Cermada inexspectata* (Larivière, 1999) for *Cixius inexspectatus* Larivière, 1999, *Cermada triregia* (Larivière, 1999) for *Cixius triregius* Larivière, 1999 (Cixiidae). *Arawa salubris* Knight, 1975 is synonymised with *Arawa negata* (White, 1879). The following Cicadellidae taxa have been incorrectly recorded or doubtfully established in New Zealand: *Alodeltocephalus obliquus* (Evans, 1938), *Balclutha rieki* Knight, 1987, *Edwardsiana crataegi* (Douglas, 1876), *Japananus hyalinus* (Osborn, 1900), *Limotettix incertus* Evans, 1966, *Paracephaleus montanus* (Evans, 1942). The cicadellid genus *Athysanus* Burmeister, 1838, is excluded from the fauna.

The areas of New Zealand showing the highest taxonomic diversity are: North Island – Wellington (73 species-group taxa), Auckland (64), Northland (60); South Island – Northwest Nelson (65), Mid Canterbury (56). The areas displaying the highest number of New Zealand endemics are: North Island – Wellington (63 species-group taxa), Northland (47), Taupo (46), Auckland (45), Bay of Plenty (40); South Island – Northwest Nelson (50), Buller (45), Mid Canterbury (40). The areas known for the highest number of local endemics are: North Island – Northland (5), Wellington (5); South Island – Northwest Nelson (4).

New Zealand Auchenorrhyncha are generally diurnal and live in lowland to mountain forests and shrublands, although a number of groups are found typically in open habitats such as tussock grasslands and in subalpine environments. Indigenous species usually live within the confines of their natural habitats but some species also live in modified ecosystems and exotic tree plantations. Depending on families and genera, species can be predominantly planticolous, arboreal, or even epigean. The hostplants are known with certainty for less than 20% of taxa. The taxonomy and biology of immature stages are largely unknown for the majority of taxa. Anecdotal evidence suggests that parasitic wasps, birds, predatory beetles, spiders, and mites may be among the major natural enemies of New Zealand Auchenorrhyncha. Overall, about 25% of the fauna is either brachypterous or micropterous. Active dispersal by flight is unlikely for the majority of New Zealand species.

Keywords. Hemiptera, Auchenorrhyncha, Cicadomorpha, Fulgoromorpha, New Zealand, catalogue, classification, distribution, biology, species endemism, fauna.

Larivière, M.-C.; Fletcher, M. J.; Larochelle, A. 2010. Auchenorrhyncha (Insecta: Hemiptera): catalogue. *Fauna of New Zealand 63*, 232 pp.

Received: 1 July 2009, Accepted: 19 October 2009.

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CHECKLIST OF TAXA

Notes. Taxa are arranged alphabetically. Synonyms of adventive taxa (A) from outside the Australian Region, are not included. A = adventive; E = endemic; N = native but not endemic to New Zealand.

Order HEMIPTERA

Suborder AUCHENORRHYNCHA

Infraorder CICADOMORPHA 34
Superfamily CERCOPOIDEA 34
Family APHROPHORIDAE 34
Genus ***Basilioterpa*** Hamilton & Morales, 1992 [N] 35
bullata Hamilton & Morales, 1992 [E] 35
Genus ***Bathyllus*** Stål, 1866 [A] 35
albicinctus (Erichson, 1842) [A] 35
convexa Walker, 1851, *Lepyronia*
moerens Stål, 1854, *Lepyronia*
albigutta Walker, 1858, *Lepyronia*
Genus ***Carystoterpa*** Lallemand, 1936 [N] 35
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ACKNOWLEDGMENTS

For the opportunity to examine material in their care we thank J. M. W. Marris (Lincoln University, Lincoln), S. D. Pollard (Canterbury Museum, Christchurch), B. H. Patrick (formerly from Otago Museum, Dunedin), J. W. Early and R. Gilbert (Auckland War Memorial Museum, Auckland), R. L. Palma and P. J. Sirvid (Museum of New Zealand Te Papa Tongarewa, Wellington), M. J. Simmons (Perth Museum and Art Gallery, Perth, Scotland), and M. D. Webb (The Natural History Museum, London).

We are indebted to N. A. Martin (Plant and Food Research, Auckland) for contributing precious personal observations on biology and leafhopper study material as well as for his help with the list of associated plants.

We are also extremely thankful to J. S. Dugdale (Research Associate, Landcare Research, Nelson) for generously sharing cicada information accumulated over his long career as an entomologist.

We are grateful to overseas colleagues for providing copies of papers unavailable in New Zealand. For this we extend special thanks to L. L. Deitz (North Carolina State University, Raleigh).

Many thanks are also extended to R. J. B. Hoare (Landcare Research, Auckland), R. L. Palma (Museum of New Zealand Te Papa Tongarewa, Wellington), and M. Moir (University of Melbourne, Melbourne, Australia) for reviewing the manuscript in its entirety before publication.

We are grateful to B. E. Rhode (Landcare Research, Auckland) for help with the distribution and literature databases, distribution maps, photographs of primary types, and curation of the New Zealand Arthropod Collection, L.H. Clunie (Landcare Research, Auckland) for technical assistance, particularly dispatching of specimens, G. Hall (Landcare Research, Auckland) for technical support, particularly additional material collected in the field.

We also express our gratitude to D. W. Helmore for the habitus drawings of the front cover and popular summary, and to Jean-Claude Stahl and Raymond Coory (Museum of New Zealand Te Papa Tongarewa, Wellington) for the habitus photos of some cicada types.

Finally we also wish to acknowledge past and present Landcare Research librarians for their valuable help with the literature search and Landcare Research editors for their input at the time of composing introductory sections of the catalogue.

The first author is forever grateful to co-author M. J. Fletcher for his many encouragements along the way, especially his generosity and mentorship since 1997 towards building up her knowledge of Auchenorrhyncha and establishing herself as an Auchenorrhyncha worker in the Southern Hemisphere.

The bulk of the work towards this catalogue, including the first author's salary, was funded by the Defining New Zealand's Land Biota Outcome Based Funding programme of the Foundation for Research, Science and Technology (Contract C09X0501). The two co-authors contributed their own personal resources towards this work.

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INTRODUCTION

The Auchenorrhyncha are a highly diverse group of hemimetabolous insects. They are treated here as a suborder of the Hemiptera and include the planthoppers (infraorder Fulgoromorpha), cicadas, froghoppers, spittlebugs, treehoppers, and leafhoppers (infraorder Cicadomorpha).

Auchenorrhyncha is a highly adaptable group that has evolved into a major component of the phytophagous insect fauna in most terrestrial ecosystems and adopted varied life habits on nearly all continents and islands (except Antarctica), suggesting a long evolutionary history. This insect group probably evolved since the lower Permian and over 42,000 extant species are described worldwide.

The world fauna comprises around 30 to 40 families depending on the classification being followed. Better known continental faunas such as those of North America, Europe, or Australia, include thousands of described species. Compared with these larger regions of the world, the New Zealand fauna, currently comprising 12 families, 68 genera, and 196 species, may appear relatively small, but what it lacks in size it makes up for in uniqueness, e.g., 82% of known species are endemic. From this point of view New Zealand can be regarded as a biodiversity "hot spot" for Auchenorrhyncha.

The present catalogue attempts to answer four questions most commonly asked by users of biosystematics information about a group of insects: What, where, when, and how? What Auchenorrhyncha occur in New Zealand, what is their status (e.g., endemic, native but not endemic, adventive, pest, disease vector) and what are the resources available to identify and study them? Where do species and genera occur (e.g., geographic distribution in New Zealand and overseas, habitats, dispersal abilities)? When are they active (e.g., seasonality, mating, oviposition, overwintering)? How do they live (e.g., feeding preferences, natural enemies)?

To answer these questions this catalogue brings together the available literature and collection-based information on extant taxa recorded from New Zealand's main islands and its offshore islands. The catalogue has been written with the needs of biosystematists, identifiers, biosecurity and conservation managers, ecologists, other biologists, and members of the public in mind, hence the sections summarising for all species the geographic distribution, biology, dispersal power, and reference to available identification tools, taxonomic revisions, and natural history treatments. A species checklist, full bibliography, taxonomic index, eight appendices, species distribution maps, and primary type photographs are also provided.

Brief history of Fulgoromorpha and Cicadomorpha taxonomy in New Zealand

The first native Auchenorrhyncha described from New Zealand were the Cicadidae *Amphipsalta cingulata* (Fabricius, 1775) and *Rhodopsalta cruentata* (Fabricius, 1775). Subsequently, until about the 1930s, the majority of taxa were mostly described by European workers such as Walker (1850–1858) and White (1879), and by two New Zealand researchers Hudson (1891) and Myers (1921–1926).

Several early attempts at cataloguing the fauna were made during that same period, especially by Butler (1874), Hutton (1874, 1898, 1904), White (1879), and Kirkaldy (1909a). Such early checklists were most often straightforward compilations, but Hutton's (1904) *Index Faunae Novae Zealandiae* was probably the most comprehensive and well documented, although his 1898 checklist was also very useful because it included keys to most known genera and several species. Kirkaldy's (1909a) *List of Hemiptera (excluding Sternorrhyncha) of the Maorian Subregion, with Notes on a few Species* was largely based on Hutton (1904), with a few additional critical comments such as new synonymies or deletions from the fauna. Subsequently, while the New Zealand faunal inventory continued to be recorded in the various fascicles of the *General Catalogue of Homoptera* published by Metcalf from the 1930s to the late 1960s, there would not be another comprehensive faunal list until Wise's (1977) *A synonymic checklist of the Hexapoda of the New Zealand sub-region, the smaller orders*. The latter recorded 11 families, 64 genera, and 160 species for the fauna, together with their synonyms, nomenclatural combinations, associated references, and some basic distributional information. A New Zealand checklist of Hemiptera (excluding Sternorrhyncha), listing valid names based on the 1977 list and subsequently published taxonomic changes, is continually being updated and made available on the internet (see Larivière, 2005, http://hemiptera.landcareresearch.co.nz/, New Zealand Hemiptera website). However, no complete synonymical checklist has been published since 1977.

Little taxonomic activity occurred during the 1940s and the 1950s, although Evans (1941, 1942, 1947) and Hudson (1950) added a few taxa to the fauna, in the leafhopper and cicada families respectively. The period from 1965 to 1984 was more prolific, yielding several new taxa and important taxonomic revisions, mainly due to the efforts of Fennah (1965; Delphacidae), Evans (1966; Cicadellidae *sensu lato*), Knight (1973–1976; Cicadellidae *sensu lato*), Fleming (1969, 1973, 1984; Cicadidae), Dugdale (1972; Cicadidae genera), and Dugdale & Fleming (1969, 1978; Cicadidae). Knight was, and remains, by far the most productive reviser of the New Zealand fauna, having worked

on most leafhopper groups, describing new genera and approximately 50 new species.

The most recent period of active taxonomic research has occurred since 1992. Of special interest are the publications of Hamilton & Morales (1992; revision of Aphrophoridae), Larivière (1997b, 1999; revision of Cixiidae), Larivière & Hoch (1998; revision of Cixiidae), Hamilton (1999b; re-examination of Myerslopiidae genera), Emeljanov (2000; new Cixiidae genus); Larivière & Fletcher (2004; identification key to genera and species of leafhopper families); Szwedo (2004a; new Myerslopiidae species); Larivière & Fletcher (2008; *Zeoliarus*, new genus of Cixiidae); and Fletcher & Larivière (2009; revision of *Anzygina*, Cicadellidae).

The best available revisions (i.e., those containing usable keys, comparative descriptions, characters of the male genitalia, type data, comprehensive synonymies, and enough distributional information), are for the families Aphrophoridae, Cicadellidae, Cicadidae (genus *Maoricicada* only), and Cixiidae. However, some or part of these groups need to be re-investigated, e.g., a new key to Aphrophoridae genera is needed, and the cicadellid genera *Arahura, Arawa, Horouta, Limotettix, Novothymbris, Paradorydium, Scaphetus, Matatua,* and *Zelopsis* need additional revisionary work. Knight's revisions of leafhopper groups and Fennah's (1965) review of the Delphacidae were based on limited study material. A large amount of new material has accumulated in collections since the end of the 1970s and these specimens remain largely unidentified. In the Cicadidae, four out of five genera have never been revised taxonomically. It may come as a surprise to many readers that the morphological taxonomy of cicadas, such an 'iconic' insect group in New Zealand, is still in its infancy and that what little published information is available is patchy and scattered. Larivière *et al*. (2006) improved access to existing information but this cannot replace the need for a thorough taxonomic treatment of the family Cicadidae.

The Delphacidae have never been thoroughly revised, although Fennah (1965) provided preliminary insights into the New Zealand fauna. The available work on Myerslopiidae and Ulopinae (Cicadellidae) is insufficient to provide a good understanding of the fauna, mainly because very few specimens were available to earlier workers. Szwedo (2004a) made a recent effort at describing new Myerslopiidae species but *ad hoc* descriptions based on very small sample sizes, sometimes involving only one sex, are not always as useful as one might think, especially in groups that are in great need of overall revision.

Furthermore, so much new material has been collected and deposited in New Zealand collections over the last 30 years – one of the most dynamic insect surveying periods in New Zealand – that numerous Auchenorrhyncha taxa remain to be described even in groups worked on by previous researchers. The authors estimate that the Auchenorrhyncha fauna may reach 300 to 350 species when totally described.

Potential revisers of the fauna, whether from New Zealand or overseas, are encouraged to examine material from all the main New Zealand entomological museums and collections (see list, p. 130). They may also find it useful to note that over 65% of primary types of New Zealand Fulgoromorpha and Cicadomorpha (see type photographs, pp. 149-191) have been deposited in this country's entomological museums and collections (see also Palma *et al*., 1989; Early & Gilbert, 1993; Nicholls *et al*., 1998), mostly in the New Zealand Arthropod Collection (NZAC). Approximately 18% of types can also be located in the Museum of Natural History (London), leaving only about 17% of types scattered among other overseas collections. The high proportion of primarily local or readily accessible type repositories means specimens can be more easily studied, making the process of revising taxa relatively less complicated for Auchenorrhyncha than for many other insect groups, which have most of their New Zealand types scattered through several overseas collections. In addition, "Virtual" collections of New Zealand types are being made available on the internet (see Larivière & Rhode, 2002, http://hemiptera.landcareresearch.co.nz/, New Zealand Hemiptera website).

Higher classification

Bourgoin & Campbell (2002) proposed five monophyletic groups within the Hemiptera: Sternorrhyncha (psyllids, aleyrodids, aphids, coccids), Fulgoromorpha (planthoppers), Cicadomorpha (leafhoppers, treehoppers, spittlebugs, cicadas), Heteroptera (true bugs *sensu stricto*), and Coleorrhyncha (moss bugs). Traditionally the Fulgoromorpha and Cicadomorpha have been referred to as Auchenorrhyncha (a suborder of Hemiptera). Several recent studies have investigated the phylogenetic relationships between the five monophyletic suborders of Hemiptera or infraorders of Auchenorrhyncha (depending on the classification followed), e.g., Campbell *et al*., 1995; Sorenson *et al*., 1995; Yoshizawa & Saigusa, 2001; Bourgoin & Campbell, 2002; Dietrich, 2002; Shcherbakov & Popov, 2002; Szwedo, 2002. Other important issues were also investigated, such as the possibility that planthoppers could be grouped under the suborder Archaeorrhyncha and other Auchenorrhyncha under Clypeorrhyncha, and whether or not Auchenorrhyncha is a monophyletic lineage.

Cryan (2005) reconstructed a molecular phylogeny of the infraorder Cicadomorpha supporting the major relationships within this group as (Membracoidea (Cicadoidea,

Table 1. **Higher classification of New Zealand Auchenorrhyncha (Hemiptera)**. [1] Achilidae are paraphyletic in Urban & Cryan's (2007) phylogenetic hypotheses, with one achilid taxon arising from within the Derbidae. [2] Hamilton (2001) gave an alternative view on Cercopoidea classification.

FULGOROMORPHA
- **Fulgoroidea**
 - **Delphacidae**
 - Asiracinae
 - Ugyopini
 - Delphacinae
 - Delphacini
 - **Cixiidae**
 - Cixiinae
 - Cixiini
 - Oecleini
 - Pentastirini
 - Semonini
 - **Derbidae**
 - Cedusinae
 - Cedusini
 - **Achilidae** [1]
 - Achilinae
 - Achilini
 - Plectoderini
 - **Dictyopharidae**
 - Dictyopharinae
 - Dictyopharini
 - **Flatidae**
 - Flatinae
 - Flatini
 - Siphantini
 - **Ricaniidae**

CICADOMORPHA
- **Membracoidea**
 - **Myerslopiidae**
 - Myerslopiinae
 - Myerslopiini
 - **Cicadellidae**
 - Deltocephalinae
 - Athysanini
 - Deltocephalini
 - Macrostelini
 - Opsiini
 - Euacanthellinae
 - Euacanthellini
 - Eupelicinae
 - Paradorydiini
 - Iassinae
 - Iassini
 - Idiocerinae
 - Macropsinae
 - Tartessinae
 - Thymbrini
 - Typhlocybinae
 - Empoascini
 - Erythroneurini
 - Typhlocybini
 - Ulopinae
 - Cephalelini
 - Ulopini
 - Xestocephalinae
 - Xestocephalini
 - **Membracidae**
 - Centrotinae
 - Terentiini
- **Cicadoidea**
 - **Cicadidae**
 - Cicadettinae
 - Cicadettini
- **Cercopoidea** [2]
 - **Aphrophoridae**

Cercopoidea)) and compared results against previous hypotheses based on molecular and morphological data. Cryan's work offers the most recent high-level phylogeny for Cicadomorphan families placing, as did Bourgoin & Campbell (2002), the Myerslopiidae as the sister group of the remaining Membracoidea. Cryan did not, however, test the hypothesis that Fulgoromorpha and Cicadomorpha may form a monophyletic lineage (the Auchenorrhyncha).

Urban & Cryan (2007) reviewed the main hypotheses previously put forward about the phylogeny of Fulgoroidea, both in terms of how planthopper families are related and how many families should be recognised. Their work represents the most encompassing phylogenetic hypothesis for this superfamily, so far using the greatest number of taxa and molecular markers.

Despite the ever growing body of phylogenetic work no final consensus has yet been reached on the monophyly and higher classification of Auchenorrhyncha. Pending further resolution of these matters, the traditional use of Auchenorrhyncha as a suborder or Hemiptera is retained in the present work. Table 1 follows mostly Cryan (2005) and Urban & Cryan (2007), and proposes a higher classification context in which to consider the taxa treated alphabetically in this catalogue. In Table 1, infraorders and families are arranged phylogenetically. Subfamilies and tribes of Auchenorrhyncha (excluding Cicadidae), follow Fletcher & Larivière (2001) and are listed alphabetically. The higher classification of Cicadidae follows Moulds (2005a).

Readers may find the following references useful to identify families and tribes of Auchenorrhyncha: Dietrich,

2000 (Cicadellidae), 2005 (Cicadomorpha), Fletcher & Carver, 1991 (Fulgoroidea), Fletcher *et al*., 1991a–b (Cercopoidea, Cicadelloidea/Membracoidea), Fletcher & Larivière, 2001 (Auchenorrhyncha), Fletcher & Stevens, 1988 (Cicadellidae), and Wilson, 2005 (Fulgoromorpha). Several links to other authoritative resources on world Auchenorrhyncha are available on the New Zealand Hemiptera website http://hemiptera.landcareresearch.co.nz/.

Geographic distribution

The New Zealand fauna is highly insular, with 41% of genera and 81% of species presently recorded as being endemic (Table 2).

The maps on pages 199–221 summarise the geographic distribution of Auchenorrhyncha species and subspecies occurring in New Zealand, based on the area codes of Crosby *et al*. (1976, 1998). This catalogue is the first attempt at presenting a synopsis of species distributions across all families of Fulgoromorpha and Cicadomorpha for New Zealand, based on information scattered through entomological collections as well as the literature. As a result, most species now appear to be more widely distributed than originally perceived in the literature; even well-studied species have been shown to occur in more areas of New Zealand. Nevertheless, roughly 95 native species, or 55% of the entire native fauna, are currently known from ten populations or fewer, and many of these species are known from the type locality only.

A greater number of species-group taxa (133) occur in the South Island, although 64 native taxa are actually restricted to this island. A slightly lower number of taxa (119) occur in the North Island, including 44 native taxa restricted to this island. As many as 65 taxa are shared between the two islands. For each auchenorrhynchan family the percentage of native species restricted to the North or South Island, or shared between the two islands, is shown in Table 4.

Patterns of taxonomic diversity and the number of known species-group taxa by areas of New Zealand are illustrated on Maps 4–7 (pp. 195–198). The areas so far known to contain the highest diversity (Map 4, p. 195) are, from north to south: North Island – ND (60: 47 endemics, 7 other natives, 6 adventives), AK (64: 45 endemics, 8 other natives, 11 adventives), WN (73: 63 endemics, 6 other natives, 4 adventives); South Island – NN (65: 50 endemics, 5 other natives, 10 adventives), and MC (56: 40 endemics, 5 other natives, 11 adventives). The areas so far known to harbour the highest number of New Zealand endemics (Map 5, p. 196) are: North Island – ND (47), AK and BP (45), TO (46), WN (63); South Island – NN (50), BR (45), and MC (40).

Some endemic species-group taxa are restricted to a single area of New Zealand (Map 6, p. 197). Currently, the areas known to have the greatest number of local endemics are: North Island – ND (5), WN (5); South Island – NN (4). This is closely followed by five areas of the South Island (SD, MB, MC, FD, SL), each with three known local endemics, but it is likely that the largely unexplored and unspoilt area of Fiordland (FD) is a greater reservoir of endemism than currently estimated.

The areas that include the largest number of adventive taxa (Map 7, p. 198) are: North Island – AK (11), HB (11); South Island – NN (10), MC (11). This result is hardly surprising given that these are relatively warm areas of New Zealand as well as its main trading ports or agricultural regions. Many of the adventive taxa have good dispersal abilities, some are attracted to artificial lights, and most can adapt well to living in highly or partly modified environments. Consequently a somewhat high number of adventives is also expected from neighbouring areas as can be observed on Map 7.

From the Chatham Islands seven out of 12 native species-group taxa (58% of fauna) are shared with the following New Zealand areas: North Island–South Island (1 taxon), North Island–South Island–SI (1); TH–North Island–South Island (3); KE–TH–North Island–South Island (1); TH–North Island (1). The Kermadec Islands share five out of 10 native taxa (50% of fauna) with TH–North Island–South Island (1 taxon), North Island–South Island (1), TH–North Island–South Island–CH (3). The Three Kings Islands, with 21 native taxa, have 17 of these (80% of fauna) in common with other parts of New Zealand: North Island–South Island (4 taxa); North Island–South Island–CH (1); North Island (7); North Island–CH (1); KE–North Island–South Island (1); KE–North Island–South Island–CH (1); North Island–South Island–SI (2). Auchenorrhyncha have never been recorded from New Zealand's subantarctic islands (Antipodes, Aucklands, Bounties, Campbell Island, or Snares).

Faunal composition and affinities

Table 2 shows the number of genera and species occurring in New Zealand compared with Australia and the rest of the world. Table 3 provides a more detailed overview of the New Zealand fauna, by families and genera. The described New Zealand fauna (196 species) is about 13% the size of the known Australian fauna (around 1500 species). Currently, 15 families of Auchenorrhyncha occurring in Australia are not represented in New Zealand. In the Cicadellidae, the largest component of Cicadomorpha biodiversity in both countries, five subfamilies and 28 tribes occurring in Australia, are not represented in New Zealand.

Table 2. Families and number of taxa of Auchenorrhyncha occurring in New Zealand, Australia, and the World. Higher classification as in Table 1. () = number of endemic taxa. * The Australian genera *Myerslopella* (6 species) and *Sagmation* (1 species) have been moved by Hamilton (1999b) from Myerslopiidae to Euacanthellinae (tribe Sagmatiini), a subfamily of Cicadellidae. ** World numbers for families of Fulgoromorpha are from Bourgoin (2008).

	New Zealand	Australia	New Zealand	Australia	World
	Genera		Species		
CICADOMORPHA					
Aphrophoridae	5(1)	7	16(14)	14	800
Cicadellidae	27(6)	230	78(52)	736	>22000
Cicadidae	5(3)	42	34(34)	234	2600
Membracidae	1(0)	38	1(0)	86	3200
Myerslopiidae*	2(2)	0	16(16)	0	20
FULGOROMORPHA**					
Achilidae	2(1)	22	2(1)	32	473
Cixiidae	11(10)	49	26(26)	158	2021
Delphacidae	10(5)	41	18(15)	721	1543
Derbidae	1(0)	19	1(1)	50	1468
Dictyopharidae	1(0)	4	1(1)	12	723
Flatidae	2(0)	26	2(0)	90	1269
Ricaniidae	1(0)	10	1(0)	31	368
Total	68(28)	488	196(160)	1515	>31093
% endemism	41%		81%		

The number of recognised adventive species in New Zealand is currently 24, or about 12% of the total Auchenorrhyncha fauna. No family is endemic to New Zealand, but all Myerslopiidae present in this country (about 70% of world species) are endemic. The three largest families in New Zealand are the Cicadellidae (78 species or 40% of the fauna), Cicadidae (34 species or 17%), and Cixiidae (26 species or 13%). These families are also well represented in Australia (see Table 2). In New Zealand, some endemic genera in the families Cicadellidae, Achilidae, Cixiidae, Delphacidae, and Derbidae are currently represented by a single species and are in need of further revision.

Most taxa shared with Australia and other parts of the world are cosmopolitan and probably introduced, except those listed in Table 5. Native taxa shared with regions neighbouring New Zealand are mostly in common with eastern continental Australia, to a lesser degree with Tasmania and Norfolk Island, and in some instances with Lord Howe Island and New Caledonia. Such faunal affinities may be indicative of a Gondwanan origin. Current data do not indicate any affinity with South America, except at the family level for Myerslopiidae. As in many parts of the world, the family Cicadellidae is taxonomically diverse and this is where most faunal affinities are observed, followed by the family Delphacidae.

At the generic level New Zealand shares 40% of its native fauna with Australia *sensu lato* (including Tasmania, Norfolk Island, Lord Howe Island), or 20 out of 50 native genera. At the species level this is approximately 5%. The composition of the shared native fauna does not appear to have varied much over the past several decades to 100 years.

As for the island groups in the Tasman Sea between Australia and New Zealand, Norfolk Island alone has one taxon (*Kikihia*: Cicadidae) with a solely New Zealand relationship. Close relationships are not generally shown with New Caledonia, except perhaps for the genus *Carystoterpa*

Table 3. **Number of genera and species of Auchenorrhyncha occurring in New Zealand**. A, adventive; **E**, endemic; *N*, native but not endemic.

INFRAORDER / **Family** / Subfamily / Tribe / *Genus*		Species	**E**	*N*	A
CICADOMORPHA					
Aphrophoridae		16	**14**	*0*	2
Basilioterpa	N	1	**1**	*0*	0
Bathyllus	A	1	**0**	*0*	1
Carystoterpa	N	12	**12**	*0*	0
Philaenus	A	1	**0**	*0*	1
Pseudaphronella	E	1	**1**	*0*	0
Cicadellidae		78	**52**	*11*	15
Deltocephalinae					
Athysanini					
Arahura	E	3	**3**	*0*	0
Arawa	N	5	**3**	*2*	0
Exitianus	N	1	**0**	*1*	0
Limotettix	N	4	**3**	*1*	0
Scaphetus	E	2	**2**	*0*	0
Deltocephalini					
Horouta	N	1	**1**	*0*	0
Maiestas	N	3	**0**	*3*	0
Macrostelini					
Balclutha	A?	3	**0**	*0*	3
Macrosteles	A	1	**0**	0	1
Nesoclutha	N	1	**0**	*1*	0
Opsiini					
Orosius	A	1	**0**	*0*	1
Euacanthellinae					
Euacanthellini					
Euacanthella	A	1	**0**	*0*	1
Eupelicinae					
Paradorydiini					
Paradorydium	N	8	**8**	*0*	0
Iassinae					
Iassini					
Batracomorphus	N	2	**0**	*2*	0
Idiocerinae					
Idiocerus	A	1	**0**	*0*	1
Rhytidodus	A	1	**0**	*0*	1
Macropsinae					
Zelopsis	E	1	**1**	*0*	0
Tartessinae					
Thymbrini					
Novothymbris	E	16	**16**	*0*	0
Typhlocybinae					
Empoascini					
Kybos	A	2	**0**	*0*	2
Matatua	E	2	**2**	*0*	0
Erythroneurini					
Anzygina	N	6	**4**	*1*	1
Typhlocybini					
Edwardsiana	A	2	**0**	*0*	2
Eupteryx	A	1	**0**	*0*	1
Ribautiana	A	1	**0**	*0*	1
Ulopinae					
Cephalelini					
Paracephaleus	N	2	**2**	*0*	0
Ulopini					
Novolopa	E	6	**6**	*0*	0
Xestocephalinae					
Xestocephalini					
Xestocephalus	N	1	**1**	*0*	0
Cicadidae		34	**34**	*0*	0
Cicadettinae					
Cicadettini					
Amphipsalta	E	3	**3**	*0*	0
Kikihia	N	13	**13**	*0*	0
Maoricicada	E	14	**14**	*0*	0
Notopsalta	N	1	**1**	*0*	0
Rhodopsalta	E	3	**3**	*0*	0
Membracidae		1	0	*0*	1
Centrotinae					
Terentiini					
Acanthuchus	A	1	**0**	*0*	1
Myerslopiidae		16	**16**	*0*	0
Myerslopiinae					
Myerslopiini					
Myerslopia	E	6	**6**	*0*	0
Pemmation	E	10	**10**	*0*	0
FULGOROMORPHA					
Achilidae		2	**1**	*0*	1
Achilinae					
Achilini					
Achilus	A	1	**0**	*0*	1
Plectoderini					
Agandecca	E	1	**1**	*0*	0
Cixiidae		26	**26**	*0*	0
Cixiinae					
Cixiini					
Aka	N	5	**5**	*0*	0
Cermada	E	4	**4**	*0*	0
Chathamaka	E	1	**1**	*0*	0
Confuga	E	1	**1**	*0*	0
Huttia	E	2	**2**	*0*	0
Koroana	E	3	**3**	*0*	0
Malpha	E	2	**2**	*0*	0
Oecleini					
Tiriteana	E	1	**1**	*0*	0
Pentastirini					
Zeoliarus	E	2	**2**	*0*	0
Semonini					
Parasemo	E	1	**1**	*0*	0
Semo	E	4	**4**	*0*	0

Table 3 (continued)

INFRAORDER Family Subfamily Tribe *Genus*		Species	**E**	*N*	A
Delphacidae		18	**15**	*2*	1
Asiracinae					
Ugyopini					
Ugyops	N	4	**4**	*0*	0
Delphacinae					
Delphacini					
Anchodelphax	E	2	**2**	*0*	0
Eorissa	E	1	**1**	*0*	0
Nilaparvata	N	1	**1**	*0*	0
Notogryps	E	2	**2**	*0*	0
Notohyus	E	1	**1**	*0*	0
Opiconsiva	N?	1	**0**	*1*	0
Sardia	N	1	**0**	*1*	0
Sulix	E	4	**4**	*0*	0
Toya	A	1	**0**	*0*	1
Derbidae		1	**1**	*0*	0
Cedusinae					
Cedusini					
Eocenchrea	N	1	**1**	*0*	0
Dictyopharidae		1	**1**	*0*	0
Dictyopharinae					
Dictyopharini					
Thanatodictya	N	1	**1**	*0*	0
Flatidae		2	**0**	*0*	2
Flatinae					
Flatini					
Anzora	A	1	**0**	*0*	1
Siphantini					
Siphanta	A	1	**0**	*0*	1
Ricaniidae		1	**0**	*0*	1
Scolypopa	A	1	**0**	*0*	1
Total (12 families, 68 genera)		196	**160**	*13*	23

(Aphrophoridae). Most taxa recorded from the Kermadec Islands are either adventive, widely distributed in the subtropical South Pacific, or (sometimes) shared with New Zealand main islands and Australia; not one species has a sole relationship with New Zealand. Only four species-group taxa (*Carystoterpa subtacta*, Aphrophoridae; *Kikihia cutora exulis*, Cicadidae; *Cermada kermadecensis*, Cixiidae; *Ugyops* (*Paracona*) *raouli*, Delphacidae) are currently recorded as being endemic to the Kermadec Islands.

Table 4. Percentage of native species restricted to the North or South Island, or shared between the two islands. Data exclude species present on offshore islands.

	North I.	South I.	Shared
CICADOMORPHA			
Aphrophoridae	70%	0%	30%
Cicadellidae	19%	64%	17%
Cicadidae	26%	41%	33%
Membracidae (adventive)	0%	0%	0%
Myerslopiidae	31%	46%	23%
FULGOROMORPHA			
Achilidae (1 sp.)	0%	0%	100%
Cixiidae	42%	26%	32%
Delphacidae	67%	0%	33%
Derbidae (1 sp.)	100%	0%	0%
Dictyopharidae (1 sp.)	0%	0%	100%
Flatidae (adventive)	0%	0%	0%
Ricaniidae (adventive)	0%	0%	0%

Notes on families

New Zealand Auchenorrhyncha are generally diurnal and live in lowland to mountain forests and shrublands, although a number of groups are typically found in more open habitats, such as tussock grasslands, and in subalpine environments. Native species usually live within the confines of their natural habitats but some species also live in modified ecosystems and exotic tree plantations. Depending on families and genera, species can be predominantly planticolous, arboreal, or even epigean. Hostplants are known with certainty for less than 20% of taxa. The taxonomy and biology of immature stages are undescribed for the majority of taxa. Anecdotal evidence suggests that parasitic wasps, birds, predatory beetles, spiders, and mites may be among the major natural enemies of New Zealand Auchenorrhyncha. Overall, about 25% of the fauna is either brachypterous or micropterous, with active dispersal by flight being unlikely for these taxa.

Cicadomorpha

Aphrophoridae. This large cosmopolitan family has relatively few representatives in New Zealand, with five genera (three natives, including one endemic) and 16 species (including 14 endemics). Also referred to as true spittlebugs, aphrophorids are xylem-feeders and usually nymphs are

Table 5. Native taxa shared with Australia, Norfolk Island, Lord Howe Island, and New Caledonia.
X, present on New Zealand main islands. AU= Australia (continental); KE=Kermadec Islands; LH=Lord Howe Island; NC=New Caledonia; NI=Norfolk Island; NZ=New Zealand; SA=South America; TA=Tasmania; TH=Three Kings Islands.

INFRAORDER **Family** Subfamily, tribe *Genus, species*	NZ	AU	TA	NI	LH	NC	SA	Other regions
CICADOMORPHA								
Aphrophoridae								
Basilioterpa	TH				X			
Carystoterpa	X			X		X		
Cicadellidae								
Deltocephalinae, Athysanini								
Arawa	X	X	X					
A. novella	X	X	X					
A. pulchra	X	X						
Exitianus plebeius	KE	X		X				Guam, Papua New Guinea, Samoa
Limotettix	X	X	X					Nearctic, Palaearctic
Limotettix pullatus	X	X	X					
Deltocephalinae, Deltocephalini								
Horouta	X	X	X					
Maiestas knighti	X	X						Fiji, Guam, Papua New Guinea
Maiestas samuelsoni	KE			X		X		Fiji, Phillipines
Maiestas vetus	X,KE	X						
Deltocephalinae, Macrostelini								
Nesoclutha phryne	X	X	X	X	X	X		Java
Eupelicinae, Paradorydiini								
Paradorydium	X	X						Ethiopian, Palaearctic
Iassinae, Iassini								
Batracomorphus adventisiosus	X	X						Vanuatu
Batracomorphus angustatus	X,KE	X		X				Fiji, Niue, Tonga
Typhlocybinae, Erythroneurini								
Anzygina	X	X	X	X				Papua New Guinea
A. zealandica	X	X	X	X				
Ulopinae, Cephalelini								
Paracephaleus	X	X	X					
Cicadidae								
Cicadettinae, Cicadettini								
Kikihia	X,KE			X				
Notopsalta	X	X						
FULGOROMORPHA								
Cixiidae								
Cixiinae, Cixiini								
Aka	X	X	X					
Delphacidae								
Asiracinae, Ugyopini								
Ugyops	X,KE	X		X	X			Indonesia, South Pacific, Ethiopian, Oriental
Delphacinae, Delphacini								
Nilaparvata	X	X						Fiji, Guam, Indonesia, PNG, Ethiopian, Oriental, Palaearctic
Opiconsiva	X	X						Ethiopian
Derbidae								
Cedusinae, Cedusini								
Eocenchrea	X	X				X		
Dictyopharidae								
Dictyopharinae, Dictyopharini								
Thanatodictya	X	X						Oriental

visible as frothy masses or "cuckoo-spit" on the stems of shrubs or small trees. However, not all species produce this froth, used by nymphs either to reduce the risk of dehydration or to deter enemies such as parasites.

Of the genera occurring on New Zealand's main islands, *Carystoterpa* and *Pseudaphronella* are of particular interest. *Carystoterpa* is native genus with endemic species occurring mostly in the North Island. The habitat of many species is unknown but members of this genus are usually found on native trees and shrubs, such as *Coprosma* (Rubiaceae) the most likely hostplant for *Carystoterpa tristis*, and on surrounding exotic vegetation. *Pseudaphronella jactator* is the largest New Zealand aphrophorid. It is a North Island species usually found on trees and shrubs in montane to subalpine environments. Both genera are characterised by fully-winged adults and species are wide-ranging in New Zealand.

Cicadellidae. With 27 genera and 78 species distributed among ten subfamilies, the leafhoppers constitute the most diverse group of New Zealand Auchenorrhyncha. The bulk of the native fauna belongs to the subfamilies Deltocephalinae, Eupelicinae, and Tartessinae. Cicadellids occur in almost every type of habitat. New Zealand deltocephalines (e.g., *Arahura, Arawa, Horouta, Limotettix*) occur predominantly on low plants (very few are arboreal, e.g., *Scaphetus*), tartessines (*Novothymbris*) inhabit trees and shrubs, and eupelicines (*Paradorydium*) live on or very close to the ground surface. As observed elsewhere (e.g., Dolling, 1991; U.K.) brachyptery is more frequent in leafhoppers living close to the ground surface. Most leafhopper genera occurring in New Zealand feed on phloem plant sap, but the introduced Typhlocybinae feed on plant parenchyma and this is also believed to be the case for native species in this subfamily.

The economic importance of cicadellids has generated a large amount of research worldwide. In New Zealand, a handful of leafhoppers, mainly in the subfamily Typhlocybinae, have some recognised economic impact on crops. *Edwardsiana froggatti* (adventive) is the most important leafhopper pest in this country, feeding on pipfruit trees (especially apples) and causing a reduction in plant vigour and photosynthesis, as well as damage to fruits. *Ribautiana tenerrima* (adventive) feeds on raspberries, boysenberries, and blackberries, and may be a minor pest in commercial berryfruit gardens. This species may be able to transfer phytoplasmas between *Rubus* plants. *Batracomorphus angustatus* (Iassinae, possibly adventive) is a plant disease vector on tomato and potato. *Anzygina dumbletoni* (possibly adventive) has been found on cane fruit and strawberries, whereas *Anzygina zealandica* (native) is a grass species which occasionally moves into commercial orchards. *Eupteryx melissae* (adventive) is a potential pest of commercially grown herbs. It is known to feed on rosemary, sage, lemon balm, mint, horehound, and catmint. *Nesoclutha phryne* (native Deltocephalinae) and *Orosius argentatus* (adventive Deltocephalinae) are recognised plant disease vectors in Australia.

Native leafhopper genera of special interest. The endemic genus *Arahura* (Deltocephalinae: Athysanini) appears to be associated with native grass species. Additional field collecting may reveal it to contain more species and to be more widely distributed than is currently recognised.

The genus *Novothymbris* (Tartessinae: Thymbrini), also endemic to New Zealand, is the most diverse leafhopper genus with 16 species, and the sole representative of the subfamily Tartessinae in this country. Species distributions suggest a rich endemic fauna adapted to the montane and subalpine environments of the southern North Island mountains and the Southern Alps (South Island).

The genus *Paradorydium* (Eupelicinae: Paradorydiini) is also unique in that all eight New Zealand species are endemic and occur only on the South Island. One species is found on Banks Peninsula (MC), one species on Stephens Island (SD), and the remaining six species show localised allopatric distributions in the Southern Alps, mostly on each side of the Westland (WD) beech gap — a *Nothofagus*-impoverished area in South Westland — although *P. philpotti* occurs on both sides of this gap and on Stewart Island. Wing condition in *Paradorydium* is characterised by submacropterous coriaceous forewings and micropterous hindwings, suggesting low vagility, including an inability to fly.

The endemic monotypic genus *Zelopsis* is arboreal, as it is usually the case for members of the subfamily Macropsinae, with southern beech (*Nothofagus*) as its hostplant. The correlation is high between the distribution of *Z. nothofagi* and that of *Nothofagus* forests on New Zealand's main islands, which may suggest related evolutionary histories and additional undescribed or extinct species in this genus.

The endemic Typhlocybinae genus *Matatua* (tribe Empoascini) is probably arboreal. This has been ascertained for *M. maorica* and is also likely for *M. montivaga*. The two species are allopatric on each side of the Cook Strait. These very small leafhoppers may prove more diverse and more widely distributed once their habitat is clarified through additional field collecting.

Anzygina is a native typhlocybine genus (tribe Erythroneurini) with a group of three endemic species (*A. barrattae, A. ramsayi, A. toetoe*) possibly representing a separate genus (see also Fletcher & Larivière, 2009) distributed on the central North Island (*A. toetoe*; BP, RI), on each side of the Cook Strait on the southern North Island

and northern South Island (*A. ramsayi*; RI, BR), and in southernmost parts of the South Island (*A. barrattae*; SL). This apparent disjunct distribution pattern at the species level probably reflects coverage gaps in terms of field collecting and identification of material in collections and museums. The curation of these very small, easily shriveled species requires critical point drying if they are to be kept in dry storage, and also dissection of the male genitalia for accurate identification. *Anzygina* species have reduced forewing venation and are believed to feed on plant parenchyma. The hostplant is confirmed for *A. toetoe* (endemic grass toetoe or *Cortaderia fulvida*, Poaceae) and suspected for *A. ramsayi* (endemic grass tree or neinei species in the genus *Dracophyllum*, Epacridaceae).

The subfamily Ulopinae represents a primitive group of leafhoppers with a wide world distribution on all land masses except the Nearctic and Neotropical Regions. Ulopine leafhoppers are small, chunky insects living close to or at the surface of the ground, e.g., in the soil near the roots of plants, in leaf litter, or on low plants. They are cryptic insects, generally resembling ground debris or leaf litter fragments accumulated beneath hostplants, and have legs adapted for jumping. Vagility is low in this group with most species lacking hindwings and possessing coriaceous forewings and, consequently, incapable of flight although fully-developed hindwings have been observed in the females of some New Zealand species (*Paracephaleus curtus*, *P. hudsoni*). Szwedo (2002) hypothesised that Ulopinae might be nocturnal insects. The endemic genus *Novolopa* is of particular interest because it is entirely a South Island and Stewart Island group that has apparently radiated into subalpine to alpine environments. Geographical and biological knowledge on this genus is scanty. Species are thought to feed on plant phloem. Hostplants can only be hypothesised for *N. falcata* (*Pimelea*) and *N. maculata* (*Kelleria*) (both Thymelaeaceae). So far as is known, all *Novolopa* species lack hindwings in both sexes.

Cicadidae. Cicadas are probably among the most familiar insects due to their loud singing at the height of the New Zealand summer. Thirty-four endemic species distributed among five genera are described from this country. New Zealand cicadas are found from lowland coastal areas to the subalpine and alpine zones, in a wide range of habitats, for example coastal sand dunes, riverbeds, grasslands, scrublands, shrublands and native forests, exotic tree plantations, as well as garden and orchard hedges. Most of the forest species occur in the North Island, while the South Island is mostly characterised by a cicada fauna living in rocky open spaces. In urban environments, clapping cicadas (*Amphipsalta* species) can often be heard singing on garden trees, buildings, fences, and even lamp posts. The clay bank cicada (*Notopsalta sericea*) can also be an urban dweller in the North Island, often using any sun-warmed flat concrete surface as a singing station. The native genus *Kikihia* comprises 14 described species, with one species (*K. convicta*) known only from Norfolk Island. In New Zealand the genus has traditionally been regarded as including three sets of endemic species grouped together by Fleming (1975, 1984), mainly on the basis of habitat preferences: the "shade singers" (*K. cauta*, *K. scutellaris*), the "green foliage cicadas" (*K. cutora*, *K. dugdalei*, *K. horologium*, *K. laneorum, K. ochrina, K. paxillulae, K. subalpina*), and the "grass and scrub cicadas" (*K. angusta, K. longula, K. muta, K. rosea*). These groups are not supported phylogenetically (see Arensburger *et al*., 2004b) but they provide a convenient way to look at species that are closely similar in external morphology and quite often also in habits, ecological preferences, and/or acoustic behaviour. The black cicadas (*Maoricicada* species), also with 14 described species, have evolved in relation to the development of the New Zealand alpine environment where they have radiated and occupied a wide range of ecological niches.

The phylogeny and biogeography of New Zealand cicadas is a popular research topic among New Zealand and overseas scientists, especially molecular biologists. It has been the subject of several recent papers including Arensburger *et al*. (2004a, phylogeny and biogeography of genera; 2004b, phylogeny and dispersal patterns of *Kikihia*), Buckley *et al.* (2001a, phylogeny of *Maoricicada campbelli*; 2001c, origin and evolution of *Maoricicada* in the alpine biota; 2002, origin of New Zealand genera; 2006, evolution of *Maoricicada*), Buckley & Simon (2007, evolutionary radiation in *Maoricicada*), and Hill *et al*. (2009, phylogeography of *Maoricicada campbelli*).

These publications are readily available and results from the above studies are not repeated here, other than to indicate that 1) the closest relatives of New Zealand cicadas are from Australia and New Caledonia, 2) the evolution of the New Zealand fauna appears to have originated from multiple dispersal events (at least two) across the Tasman Sea, from Australia and possibly New Caledonia within the last 12 million years, and 3) more recently, approximately within the last five million years, speciation events led to the highly diverse genera *Kikihia* and *Maoricicada*, most likely through adaptive radiation in new habitats created by the rise of the Southern Alps.

Although the ancestors of extant taxa might have arrived via transoceanic dispersal, New Zealand cicadas have relatively short hindwings and long-distance dispersal by flight is now unlikely in most cases.

Little has been published on the biology of New Zealand cicadas apart from some basic information on singing stations, habitats, and acoustic behaviour. As in other faunas,

the life of New Zealand cicadas is mostly spent in the nymphal stage, underground, and feeding on the roots of plants. Limited knowledge is available about life span, but the consensus amongst local entomologists is that at least some New Zealand species spend three to five years as nymphs, and two to four months as adults. Marris (2007) reported the following organisms as potential enemies of cicadas: parasitic wasps (cicada eggs); predatory beetles (cicada nymphs); fungal diseases (cicada nymphs and adults); kiwi birds (late instar cicada nymphs reaching the ground surface); various other birds, and spiders (cicada adults). The economic importance of cicadas is usually low, but when they occur in very large numbers significant damage may be caused by the female creating open cuts in plant tissue where eggs are laid, thus providing suitable access to boring insects and pathogens, e.g., *Amphipsalta* species in exotic tree plantations and fruit orchards. Pullulations (mass emergences) of cicadas can also become a major annoyance to workers in forestry and horticulture, whose activities are disrupted by loud song and repeated contact with flying insects.

The following general cicada references may be of interest to readers. Gibbs (2006) discussed the phenomenon of speciation through adaptive radiation in New Zealand cicadas. Larivière *et al.* (2006) provided a virtual guide to New Zealand cicadas, including identification tools and information on distribution, habitats, and songs. Marris (2007) wrote a very useful popular overview, including general information on morphological appearance, species diversity, habitats, distribution, life cycles, and enemies.

Membracidae. Only one horned treehopper species, *Acanthuchus trispinifer*, has so far been recorded from New Zealand and it is an Australian adventive. Membracids are usually sedentary but are capable of jumping strongly when disturbed. Adults and nymphs are often gregarious and nymphs are ant-attended. The biology and distribution of *A. trispinifer* in New Zealand have been studied by Eyles (1971).

Myerslopiidae. This is a small relict group of Southern Hemisphere leafhoppers, once thought to belong to the subfamily Ulopinae (Cicadellidae) but now recognised as a monophyletic lineage and a sister-group to all other Membracoidea families (Cryan, 2005). Myerslopiids are small, cryptic, ground-dwelling insects. Adults and nymphs live in leaf litter and other ground debris of high organic content forests. New Zealand taxa are characterised by large heads, spinose hindlegs, compact almost barrel-shaped bodies with cuticular extensions on head and thorax, other prominences and punctures on their coriaceous forewings, and other parts of the body that is usually encrusted with soil and litter particles offering nearly perfect camouflage with their surroundings. Functional hindwings are lacking in all species. Vestigial wing buds have been only observed in *M. magna magna*, the most widely distributed taxon. Consequently, active dispersal by flight is excluded for this family. The feeding strategies of Myerslopiidae are unknown (Szwedo 2004a), but they are thought to feed on fungi from the decomposing leaf and soil debris in which they live. Two endemic genera are known from New Zealand, *Myerslopia* (six species, two subspecies) and *Pemmation* (nine species, three subspecies). Of the 15 species of New Zealand Myerslopiidae, six (five *Myerslopia*, one *Pemmation*) are currently known from the type locality only.

Of the six *Myerslopia* species, three have a disjunct distribution in the South Island and Stewart Island. One species, *M. magna*, is distributed in both the North and South Islands, with the nominotypical subspecies *M. magna magna* occurring in the southern half of the North Island, from the Central Volcanic Plateau (or Taupo Line, approx. 39ºS) south to northwestern areas of the South Island (MB, NN, SD). The subspecies *M. magna amplificata* is distributed slightly further southwest in the South Island (BR), and *M. magna scabrata* is apparently restricted to Fiordland (FD), the south-westernmost region of the South Island. Two species are found only in the North Island and show, like their South Island congeners, a highly disjunct distribution pattern between them. *Myerslopia tearohai* is found in the southeast of the northern half of the North Island on Mount Te Aroha, Bay of Plenty (BP), and *M. triregia* is endemic to the Three Kings Islands located northwest of the North Island.

In *Pemmation*, three species (*P. bifurca, P. terrestre, P. verrucosum*) are restricted to the North Island, two species (*P. asperum, P. parvum*) are shared between the North and South Islands, and four species (*P. insulare, P. montis, P. simile, P. townsendi*) occur only in the South Island. No species is so far known from Stewart Island. *Pemmation asperum* is shared between both main islands, with *P. asperum asperum* occurring north of the Cook Strait in southernmost areas of the North Island, and *P. asperum cognatum* in mid-Canterbury (MC) in the South Island. *Pemmation parvum* shows a broad distribution from the Auckland (AK) region in the North Island, south to Westland (WD) in the South Island. Of the South Island endemics, *P. townsendi* is the most widely distributed with *P. insulare* and *P. simile* occupying what appears to be a subset of the distribution of *P. townsendi* in NN and WD respectively, although neither is known to occur in the same locality as *P. townsendi*.

Much more field collecting and associated taxonomic research is required before sufficient information on distribution, biology, and comparative morphology is obtained

so that a reasonable understanding of the evolutionary history of this highly interesting Gondwanan group can be gained. New Zealand has 70% of the world species of Myerslopiidae, with relatives in South America (Chile) only. The genera *Myerslopella* Evans, 1977 (Australia) and *Sagmation* Hamilton, 1999 (New Caledonia, Australia) have been placed in the tribe Sagmatiini (Cicadellidae: Euacanthellinae) by Hamilton (1999b) who dismembered the subfamily Myerslopiinae based on a morphological study suggesting that superficial similarities in these genera are convergent, probably in response to similar life habits.

The disjunct distribution of Myerslopiidae in New Zealand and Chile is similar to that of Coleorrhyncha (Peloridiidae) although these also occur in Australia, Tasmania, and Lord Howe Island. According to Hamilton (1999b) there are few insect families with such Southern Hemisphere distributions, suggesting a transantarctic dispersal route available to flightless insects before the breakup of Gondwana. In the rare case of wingless genera with low number of extant species confined to Chile and New Zealand, the implication is of a very long evolutionary history of faunal elements that have persisted virtually unchanged since the Gondwanan breakup.

Fulgoromorpha

Achilidae. Achilid nymphs may generally be found in logs, under loose bark, or in leaf litter where they are believed to feed on fungus. Adults feed on phloem and generally lay their eggs by attaching them to woody particles in the leaf litter or to soil particles. Little is known about the biology of *Agandecca annectens*, the only native and endemic Achilidae known from New Zealand, but the life habits of this lowland to subalpine, forest-shrubland species may follow what is generally known for the family. Adult *Agandecca annectens* are macropterous, which may assist in their dispersal.

Cixiidae. Larivière (1999) revised the New Zealand fauna and provided an exhaustive account of the distribution and biology of all species. Cixiid nymphs appear to live primarily underground and feed on plant roots. Eggs are usually laid in the soil and surrounded by a waxy secretion produced by the adult female. These facts have not, however, been verified for most known species. Adults are phloem-feeders. Little is known about hostplant requirements although most New Zealand species appear to favour woody dicotyledons, a lesser number of species are associated with ferns, and very few feed on gymnosperms. Species of the genus *Zeoliarus* occur and feed on monocotyledons, mainly Poaceae and *Phormium* (Phormiaceae). Habitat preferences have been observed, for example, most New Zealand cixiids inhabit forested or bush environments, including scrublands and shrublands, from coastal lowlands to the subalpine zones. The majority of genera are found in lowland to lower mountain mixed podocarp-broadleaf habitats. The genus *Aka* may be closely associated with *Nothofagus* forests and possibly represents an older lineage. *Semo* is strictly a subalpine genus containing highly similar allopatric species; this may indicate relatively recent speciation. *Confuga persephone* is the only cave-dwelling species known from New Zealand to date. New Zealand cixiid planthoppers are mostly characterised by submacropterous to macropterous wingforms, with a tendency towards brachyptery more strongly demonstrated in the genera *Aka* and *Chathamaka*. In New Zealand the main economic importance of Cixiidae is as vectors of phytoplasma plant diseases, e.g., *Zeoliarus atkinsoni*, on flax (*Phormium*) species.

Delphacidae. Delphacids may be the most economically important planthopper family in the world because they feed on, or transmit virus diseases, to cereals, an important food source for humans globally. Adults feed on the phloem of monocots. Like the adults, nymphs roam freely. Only one species, *Toya dryope*, is currently recorded as being adventive to New Zealand. The native biostatus of *Opiconsiva dilpa* remains uncertain. However, neither of these species are recognised as plant pests or plant disease vectors in this country. *Nilaparvata lugens* is a vector of virus disease of rice in South-East Asia but there is no evidence of disease transmission by its New Zealand congener *Nilaparvata myersi*. All other species of Delphacidae are endemic to New Zealand. Wing polymorphism is displayed by some species, but most New Zealand endemics are brachypterous or, in a few cases, species may possess well-developed forewings and vestigial hindwings, e.g., *Sulix*. Consequently, New Zealand delphacids are thought to have low vagility by flight.

Derbidae. The nymphs of some species of Derbidae feed on fungi while most adults feed on the phloem of vascular plants. Little is known about the biology of *Eocenchrea maorica*, the only native and endemic derbid so far known from New Zealand. However, the life habits of this North Island, lowland-montane, forest species are expected to resemble those generally encountered in other derbids. Adults, including newly emerged individuals (tenerals), have been found on *Astelia banksii* (Asphodelaceae) which occurs on the forest floor of lowland forest and which may serve as a food plant. The fact that recently emerged adults have been found on this plant could provide clues about the general forest floor environment required for oviposition and nymphal development. Adults *Eocenchrea maorica* are macropterous, which may assist their ability to disperse.

Dictyopharidae. The family Dictyopharidae is poorly represented in the Australasian region and only one species *Thanatodictya tillyardi* is known from New Zealand. This species is endemic, with other *Thanatodictya* species occurring in Australia. Species of this genus have the head extending considerably in front of the eyes into a long process (see drawing on front cover of this contribution). Nymphs and adults feed on grass.

Flatidae. The flatid planthoppers occurring in New Zealand are Australian adventives. Their taxonomy and biology have been well studied by Fletcher (1979a, 1985, 1988, 2002). Nymphs are sessile and produce abundant wax filaments. Species are macropterous, apparently polyphagous on various plant families, feed on vascular plant phloem, and are wide-ranging in New Zealand. *Anzora unicolor* is of economic importance as vector of fireblight on apple and pear.

Ricaniidae. The only ricaniid planthopper occurring in New Zealand is an adventive species from Australia. The biology and economic importance in New Zealand of *Scolypopa australis*, the passionvine hopper, has been well studied locally, e.g., Cumber, 1966, 1967; Deitz, 1981; Hill & Steven, 1989. Biology, development, and oviposition in Australia have been described by Fletcher (1979b). This species is polyphagous and occurs on a wide range of plants in New Zealand, and is a pest of vine crops such as kiwifruit. In addition, *S. australis* sometimes feed on poisonous plants, e.g., tutu or *Coriaria arborea*, and secrete honeydew which, in times of low nectar supply, may be gathered by honey bees and incorporated into honey that is consequently poisonous to humans (Palmer-Jones *et al*., 1947). *Scolypopa australis* is a macropterous species dispersing easily and occurring in large numbers during the summer months. It is not unusual to find individual plants (native or exotic) covered by hundreds of individuals.

Conservation

The Department of Conservation has responsibility for protecting and conserving New Zealand's native plants and animals. The Department's *Species Priority Ranking System* of Molloy & Davis (1994) provided criteria for scoring species according to various levels of threat so that management and/or recovery plans could be subsequently established. A list of priority invertebrate species for conservation was established in this way by Molloy & Davis (1994). McGuinness (2001) used these criteria and developed species profiles for taxa on the list, providing additional descriptive information to initiate or support key conservation actions. In addition, McGuinness (2001) added a number of invertebrates of potential conservation interest to the original list.

The Department of Conservation's *Species Ranking System* categories as translated in the 2001 profiles and applied to Auchenorrhyncha are presented here in order to provide a comparative framework to consider species in this catalogue and those belonging to the suborder Heteroptera (see Larivière & Larochelle, 2004 catalogue). One species of Cicadomorpha and five species of Fulgoromorpha were profiled by McGuinness (2001): *Maoricicada myersi* (Cicadidae, conservation category I); *Confuga persephone* (Cixiidae, conservation category A); *Huttia nigrifrons* (Cixiidae, conservation category I); *Malpha cockcrofti* (Cixiidae, conservation category I); *Malpha muiri* (Cixiidae, conservation category I); and *Semo harrisi* (Cixiidae, conservation category I). Category A referred to "highest priority threatened species for conservation action", and category I to "species about which little is known but, based on existing knowledge, are considered to be under threat".

The most recent simultaneous review of the *New Zealand Threat Classification System* and the *Lists of Threatened Taxa* occurred in 2005, but was not published until 2007 (see Hitchmough *et al*., 2007). It provided revised threat classifications and categories for the above taxa, except *Huttia nigrifrons*, which was not included in the list. This is a well-known, broadly distributed species in the North Island that, in any case, needed to be removed from the list of threatened species.

The conservation status of the Auchenorrhyncha species listed by Hitchmough *et al*. (2007) is reviewed here. The threat category 'Range Restricted' applied to *Maoricicada myersi* (Cicadidae) and *Confuga persephone* (Cixiidae) appears appropriate. The threat category 'Sparse' to *Semo harrisi* (Cixiidae) is not appropriate. This well-known, wide-ranging South Island species should be excluded from any threat classification. If *Malpha cockcrofti* and *M. muiri* (Cixiidae) are to be kept under the threat category 'Sparse', then the 95 taxa listed in Appendix H, roughly one in two Auchenorrhyncha, would probably warrant consideration by the Department of Conservation for threat classification. However, there is no tangible evidence whatsoever to suggest that *Malpha cockcrofti*, *M. muiri,* or any other taxa in Appendix H have suffered high rates of decline in the past, and have now stabilised in refugia as Hitchmough *et al*. (2007) seems to suggest for species listed as 'Sparse' or 'Range Restricted'. The most recent Department of Conservation *New Zealand Threat Classification System Manual* (Townsend *et al*., 2007) replaces the categories 'Range Restricted' and 'Sparse' by a single category 'Naturally Uncommon', but this probably does not apply to *Malpha cockcrofti*, *M. muiri,* or most other taxa in Appendix H either.

It is more likely that most of the 95 taxa in Appendix

H, including *M. cockcrofti* and *M. muiri*, should be considered as data deficient, consequently needing further investigation and without reasonable basis on which to apply any sound threat classification category at this stage. Information on these taxa is simply too scanty, as is the case for many hemipterans that are not taxonomically revised, biologically well-known, or well surveyed. Appendix H should therefore be regarded as a watch list for future consideration and further taxonomic work, to be reviewed as more knowledge is gained about these taxa.

METHODS AND CONVENTIONS

This catalogue is based on an exhaustive survey of the literature published between 1777 and July 2009 (over 800 publications) and the recording of information associated with authoritatively identified specimens deposited in the following New Zealand entomological museums and collections:

AMNZ Auckland War and Memorial Museum, Auckland.

CMNZ Canterbury Museum, Christchurch.

LUNZ Entomology Research Museum, Lincoln University, Lincoln.

MONZ Museum of New Zealand Te Papa Tongarewa, Wellington.

NZAC New Zealand Arthropod Collection, Landcare Research, Auckland.

OMNZ Otago Museum, Dunedin (including BPNZ, Brian Patrick Private Collection).

Field surveys and collecting techniques. Most areas of New Zealand have been visited by Auchenorrhyncha collectors. This has provided a basic inventory of taxa and resulted in New Zealand collections having representatives of most species, either described or undescribed. The South Island has generally received the closest attention whereas the North Island has been somewhat neglected by collectors, except for the Northland, Auckland, and Wellington areas. Coastal habitats (estuaries, sand dunes, salt marshes, mangroves), flaxlands, edges of streams crossing forests, the underside of loose tree bark, mosses, and rotten logs are among the macro- and microhabitats least surveyed.

The material collected so far is rich in geographical information but often poor in associated biological data. Furthermore, many species are represented only by a few specimens, impeding the ability of taxonomists to assess morphological variations within and between populations. More specialised field surveys need to be carried out in the future in order to provide a more detailed picture of geographical distribution and to increase our knowledge of the natural history of as many species as possible.

Taxonomic information. The appropriate taxonomic literature was checked to obtain original spellings, years of publication, page citations, type-species designations, type-locality information, and the nomenclatural acts and changes affecting the status of New Zealand taxa.

The catalogue is arranged alphabetically by infraorder, superfamily, family, subfamily, tribe, genus, subgenus, species, and subspecies. This arrangement provides the quickest access to information and the easiest use of the catalogue by non-specialists, as well as specialists. A table showing the higher classification of Fulgoromorpha and Cicadomorpha is also provided (Table 1). The nomenclature adopted in this catalogue adheres to the provisions established in the *International Code of Zoological Nomenclature*, Fourth Edition (1999).

Family-group names. Valid names of families, subfamilies, and tribes (when available) are given as bold centred headings. Treatment of nomenclature of family-group names is not included. The familial classification adopted in this catalogue is explained in the Introduction (see pp. 20–22) and follows Table 1.

Genus-group names. Valid names are given with author and year as bold centred headings. Under this heading the valid name and its synonyms, in chronological order, are given with citation of the original authority, year of publication, and page reference. Information on original rank, availability, homonymy and synonymy, or changes of rank are also included. Incorrect subsequent spellings are not given unless they affect our understanding of the nomenclature. The full synonymy of adventive taxa from outside the Australian Region is omitted except in some cases for added clarity. Instead, literature references providing access to the complete synonymy are given. Type species (in their original combination) and method of fixation are given for valid native genus-group names as well as synonyms. Strict adherence is given to the definition of "available name" by the *International Code of Zoological Nomenclature* (1999).

Species-group names. Valid names are given in their current combination with author and year as bold left justified headings. Under this heading valid names of native species, subspecies, and their synonyms are given in chronological order as for genus-group names. Information on original rank, availability, homonymy and synonymy, or changes of rank are also included. Incorrect spellings are not given unless they affect our understanding of the nomenclature. The full synonymy of adventive taxa from outside the Australian Region is omitted except in some cases for added

clarity. Instead, literature references providing access to the complete synonymy are given. New combinations are listed chronologically and followed by a colon (:) and the bibliographic reference of the combination. Type data are provided for available names of native species and subspecies.

Due to conservation imperatives, common names of cicadas have been provided or created anew. For other Auchenorrhyncha groups, only previously existing common names have been provided.

Biostatus. This is indicated for all genera, species, and subspecies (A=adventive; E=endemic; N=native but not endemic). The biostatus categories used are defined in the glossary (Appendix A). A combination of criteria was used to assess whether taxa were adventive including: recency of first New Zealand record in the literature and collections; fit of current geographical and ecological distribution with recognised natural patterns or similarity of such distribution with that of other adventive arthropods; and dispersal ability, especially in relation to flightlessness and distance from the nearest overseas populations.

Type data. These are listed in the following format: Type, Holotype, Lectotype, Syntypes, or Neotype followed by sex (accompanied by number of specimens in the case of syntypes), acronym of entomological collection or museum (repository; see Appendix C for list of acronyms), area code (Crosby *et* al. 1976, 1998) of type locality and name of type locality. An asterisk indicates type specimen(s) not seen by the authors.

Photographs of primary types deposited in New Zealand collections and museums were captured through a Leica DC500 digital camera on a Leica MZ-12 stereo-microscope or, in the case of larger specimens, with a Canon 20D or 40D as well as the in-focus composite imaging systems Auto-Montage (Synoptics, U.K.) and Helicon Focus (HeliconSoft, Ukraine). Type label information was digitised using a flat bed scanner (Microtek ScanMaker 4). Further photo-processing and figure layouts were done with the software packages PhotoShop® and CorelDRAW® graphics suite. The type photographs in this catalogue (pp. 149–191) and photos of other types are available on the Landcare Research website (http://www.landcareresearch.co.nz, New Zealand Hemiptera website).

Geographic distribution. The catalogue contains distributional information for genera, subgenera, species, and subspecies, based on literature and specimen label data. The distribution of supraspecific groups is usually given as broad geographical regions, or in slightly more detail if the taxon is widely known within the Australian Region.

For species and subspecies, the area codes of Crosby *et al*. (1976, 1998) are given in alphabetical order for the North Island, South Island, Stewart Island, and Offshore Islands, respectively. When appropriate, the extralimital distribution (outside New Zealand and its offshore islands) is also included, as well as the first New Zealand records of adventive species. Full distributional information is given for species and subspecies known from ten localities or fewer with the collection acronym or literature reference supporting each record. Appendix E contains a list of the main collecting localities and their geographic coordinates.

Two-letter abbreviations for the area codes of Crosby *et al*. (1976, 1998) used in this catalogue are as follows (see maps 1–3, pp. 192–194):

New Zealand. North Island: AK, Auckland; BP, Bay of Plenty; CL, Coromandel; GB, Gisborne; HB, Hawke's Bay; ND, Northland; RI, Rangitikei; TK, Taranaki; TO, Taupo; WA, Wairarapa; WI, Wanganui; WN, Wellington; WO, Waikato. **South Island**: BR, Buller; CO, Central Otago; DN, Dunedin; FD, Fiordland; KA, Kaikoura; MC, Mid Canterbury; MK, Mackenzie; NC, North Canterbury; NN, Nelson; OL, Otago Lakes; SC, South Canterbury; SD, Marlborough Sounds; SL, Southland; WD, Westland. **Stewart Island,** SI. **Offshore Islands**: AN, Antipodes Islands; AU, Auckland Islands; BO, Bounty Islands; CA, Campbell Island; CH, Chatham Islands; KE, Kermadec Islands; SN, Snares Islands; TH, Three Kings Islands.

The authors are aware of the arbitrary nature of the Crosby *et al*. (1976, 1998) system for recording specimen localities, as well as its obvious limitations when it comes to uncovering biogeographical patterns. Nevertheless, recording geographic information in this way is a useful, well-established approach adopted by most New Zealand entomological collections, museums and publication series. It has the advantages of allowing distributional information to be uniformly recorded and easily compared. Broad biogeographical trends can still be observed and it remains relatively easy to relate species distributions to any one of a range of 'more natural' land or ecosystem classifications, e.g., Department of Conservation's Ecological Regions and Districts of New Zealand, especially when georeferenced point-data are also available.

During the course of this research species-level geographical information and type-locality data were maintained in a MicrosoftAccess® database. This database was used to prepare the species distribution maps (pp. 199–221, presented alphabetically by taxa), the maps on taxonomic diversity (pp. 195–198), and the appendices listing type localities (Appendix G) and species by areas of New Zealand (Appendix F). All maps were prepared using the software CorelDRAW graphics suite. Appendix D provides a list of taxa incorrectly or erroneously recorded from New Zealand.

Biological information. The information provided under the heading **Biology** is based on the literature and specimen label data. In order to eliminate spurious records, an effort was made to summarise available information by using the smallest common denominator representing the essentials of each species' requirements. Information given between square brackets (e.g., []) is assumed from available knowledge on related taxa. Biological trends were summarised for each species, using a series of standardised terms following the approach taken in the previous catalogue on the suborder Heteroptera (Larivière & Larochelle, 2004). Many terms used in this catalogue are defined in the glossary (Appendix A). Altitudinal distribution, or distribution related to altitude or elevation, is expressed as coastal, lowland, montane, subalpine, and alpine, following the categories used by Brownsey & Smith-Dodsworth (2000). Habitat and/or plant associations are listed from most commonly encountered to least commonly encountered associations. When this is not known, plants are listed alphabetically. Seasonality, or the period of year when an animal is active, is expressed as months from September (start of spring) to August (end of winter). Because this information was gathered mostly from collection data, it may only be loosely indicative of actual seasonality. Feeding-type is indicated as much as possible. Dispersal power, or the capability of dispersal, has been assessed when possible, using wing condition and flight data (including light-trapping observations). Wing condition was evaluated for each species using the literature and personal observations made in the field and in the laboratory.

References. Under Reference(s), only the most important references are given for valid taxa, with an indication of their contents between parentheses. In general the authors aimed to limit the number of references to no more than ten for each species or subspecies. Page numbers are only provided for taxonomic citations from recent catalogues.

Notes. Additional information is given as Notes under each valid taxon.

CATALOGUE

Taxa are listed in alphabetical order from infraorders to subspecies. Valid subordinal and family-group names are presented without authorship and date of publication; such information can readily be obtained from recent world catalogues and revisions. Each genus-group name or species-group name is listed with its author(s), date, and page of publication. Valid species-group names are listed alphabetically in ***bold italics*** in their ***current combinations***; they are also recorded in *italics* in their *original combinations*. Synonyms are presented chronologically and in *italics* in their *original combinations*. Synonyms of adventive species from outside the Australian Region are omitted, except in some cases for more clarity. The New Zealand biostatus (**A**=adventive; **E**=endemic; **N**=native but not endemic) of each genus- and species-group taxon is indicated in **bold** $^{\textbf{superscript}}$ font following valid names.

Order HEMIPTERA

Suborder AUCHENORRHYNCHA

Infraorder CICADOMORPHA

References. Cryan, 2005 (classification, phylogeny). Dietrich, 2005 (keys to families), 2006 (bibliography, identification).

Superfamily CERCOPOIDEA

Family APHROPHORIDAE

Spittlebugs

References. Lallemand, 1928 (revision, Samoa), 1937 (checklist, Oceania; Cercopidae). Zimmerman, 1948 (Hawaii, revision). Metcalf, 1962a (catalogue, world). Evans, 1966 (Australia, New Zealand, taxonomy). Wise, 1977 (checklist, New Zealand). Hamilton, 1980a (revision, Polynesia), 1980b (revision, Solomon Islands), 1981a (Loyalty Islands, New Caledonia, revision), 1981b (Banks Islands, Fiji, New Hebrides, revision). Fletcher *et al.*, 1991a (Australia, overview; Cercopoidea). Hamilton & Morales, 1992 (New Zealand, revision; as Cercopidae). Liang, 1998 (Oriental Region, Palaearctic Region, taxonomy). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2002a (Australia, checklist; update by Fletcher, 2006). Liang & Fletcher, 2002 (classification, morphology), 2003 (Australia, key to genera, review). Larivière, 2005 (checklist, New Zealand).

Genus *Basilioterpa* Hamilton & Morales, 1992 [N]

Basilioterpa Hamilton & Morales, 1992: 12. Type species: *Basilioterpa bullata* Hamilton & Morales, 1992, by original designation.

Geographic distribution. Australia (Lord Howe Island), New Zealand (Three Kings Islands).

References. Hamilton & Morales, 1992 (New Zealand, revision). Liang & Fletcher, 2003 (Australia, distribution, taxonomy).

Basilioterpa bullata Hamilton & Morales, 1992 [E]

Type photograph p. 149.

Basilioterpa bullata Hamilton & Morales, 1992: 12. Holotype male (NZAC); TH, West Island.

Geographic distribution (Map p. 199). Offshore Islands: TH–South West Island (Hamilton & Morales, 1992). West Island (NZAC).

Biology. Lowland, coastal. Collected on *Entelea*, *Meryta sinclairii, Myrsine, Pittosporum*. Seasonality: February. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Genus *Bathyllus* Stål, 1866 [A]

Bathyllus Stål, 1866a: 68. Type species: *Lepyronia moerens* Stål, 1854 (=*Aphrophora albicincta* Erichson, 1842), designated by Lallemand, 1912: 52.

Bathylus [*sic*]: Evans, 1966: 316.

Geographic distribution. Australia (continental, Tasmania); New Zealand (adventive).

References. Metcalf, 1962a: 193–195 (catalogue, world). Evans, 1966 (Australia, taxonomy). Liang & Fletcher, 2003 (Australia, distribution, taxonomy).

Bathyllus albicinctus (Erichson, 1842) [A]

Aphrophora albicincta Erichson, 1842: 285. Type status and repository unknown; "Van Diemen's Land" [=Tasmania].

Lepyronia convexa Walker, 1851b: 726. Syntypes (2)* (BMNH); "New Holland" [=Australia]. Synonymised by Evans, 1966: 318.

Lepyronia moerens Stål, 1854: 251. Syntype(s)* (NHRM): "Nova Hollandia" [=Australia]. Synonymised by Evans, 1966: 318.

Lepyronia albigutta Walker 1858a: 191. Holotype* sex undetermined (BMNH; "from Mr Edwards" collection); Melbourne. Synonymised by Evans, 1966: 318.

Bathyllus albicinctus: Hacker, 1926: 246.

Bathylus [*sic*] *albicinctus*: Evans 1966: 318.

Geographic distribution (Map p. 199). North Island: ND–Whangarei region, including Bream Bay, Ocean Beach, Urquharts Bay. First New Zealand record: ND–Whangarei region (Ashcroft & George, 2004). Extralimital range: Australia (continental, Tasmania).

Biology. [Lowland.] Found along coastal beaches. Collected on *Calystegia soldanella, Senecio elegans, Senecio mikanioides* (adults, nymphs, spittle masses), *Arctotis stoechadifolia, Dactylis glomerata* (nymphs, spittle masses), and *Lathyrus latifolius* (adults); all potential hostplants. In Australia, mostly found on low herbaceous plants; also collected on small tufted lilies where it occurs right down into the bases of the leaves in a mass of spittle. Seasonality: September, October. Xylem-feeder. Wing condition: Macropterous, with coleopteroid forewings.

References. Metcalf, 1962a: 194 (catalogue; world). Evans, 1966 (Australia, taxonomy). Liang & Fletcher, 2003 (Australia, distribution, taxonomy).

Notes. This species appears well established in the Whangarei region (ND) and may become more widespread in the future, given its southern distribution in Australia and the wide distribution of its potential hostplants in New Zealand. Ashcroft & George (2004) reported that this species disperses by flight although adult wing condition suggests that *B. albicinctus* is unlikely to fly long distances.

Genus *Carystoterpa* Lallemand, 1936 [N]

Carystoterpa Lallemand, 1936: 264. Type species: *Ptyelus trimaculatus* Butler, 1874, by original designation.

Geographic distribution. New Caledonia, Norfolk Island, New Zealand.

References. Metcalf, 1962a: 554–556 (catalogue, world). Evans, 1966 (taxonomy). Wise, 1977: 71 (checklist, New Zealand). Hamilton & Morales, 1992 (New Zealand, revision).

Note. Liang & Fletcher (2003) did not include the Norfolk Island endemic *Carystoterpa fusiformis* Hamilton & Morales, 1992, in their review of the Australian fauna.

Carystoterpa aurata Hamilton & Morales, 1992 [E]

Carystoterpa aurata Hamilton & Morales, 1992: 13. Holotype* female (BMNH); WN, Silverstream.

Geographic distribution (Map p. 199). North Island: WN–Silverstream.

Biology. [Lowland.] Habitat: Unknown. Seasonality: December. [Xylem-feeder.] Wing condition: Unknown.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Carystoterpa chelyon Hamilton & Morales, 1992 [E]

Carystoterpa chelyon Hamilton & Morales, 1992: 13. Holotype* male (BMNH); ND, Kaitaia.

Geographic distribution (Map p. 199). North Island: ND–Houhora (Hamilton & Morales, 1992). Kaitaia (NZAC). Kohukohu (Hamilton & Morales, 1992). Te Kao (Hamilton & Morales, 1992). Te Paki (Hamilton & Morales, 1992).

Biology. Lowland. Collected on *Leptospermum scoparium*. Seasonality: November– December, March. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Note. According to Hamilton & Morales (1992) the holotype should be in NZAC but only four paratypes of this species could be located in that collection.

Carystoterpa fingens (Walker, 1851) [E]

Ptyelus fingens Walker, 1851b: 718. Lectotype* male (designated by Hamilton & Morales, 1992; BMNH); type locality uncertain (presumably Auckland vicinity; see **Notes** below).

Philaenus fingens: White, 1879: 215.

Carystoterpa fingens: Evans, 1966: 323.

Geographic distribution (Map p. 199). North Island: AK, BP, CL, ND, TK, WI, WN. South Island: KA, NN, SD. Offshore Islands: TH.

Biology. Lowland, mostly coastal. Collected on *Alcea*, *Astelia*, *Cassinia retorta* [=*Ozothamnus leptophyllus*], *Carmichaelia*, *Coprosma lucida*, *C. macrocarpa*, *C. repens*, *Geniostoma*, *Hebe*, *Hieracium* (occasionally on *H. pilosella*, commonly on *H. caespitosum, H. lepidulum, H. praealtum*; adults, nymphs), *Kunzea ericoides*, *Leptospermum scoparium*, *Melicytus*, *Melicytus-Corynocarpus* associations, *Metrosideros excelsa*, *Muehlenbeckia*, *Myoporum laetum*, *Olearia*, *Phormium*, *Pseudopanax*, *Solanum*, *Tecoma*; coastal shrubs in general. Seasonality: September–March (mostly November–January), August. [Xylem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1962a: 45 (catalogue, world; as *Ptyelus fingens*). Evans, 1966 (taxonomy). Wise, 1977: 71 (checklist, New Zealand). Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy). Syrett & Smith, 1998 (biology).

Notes. The long list of nomenclatural citations given under *C. fingens* by Wise (1977) was updated by Hamilton & Morales (1992) who recognised *C. trimaculata* and *C. subvirescens* as valid species. The male lectotype was collected by W. Colenso and the type locality, according to Hamilton & Morales (1992), is presumably in the North Island, in the vicinity of Auckland. The distribution records from TK and KA are based on females, probably of this species, that could not be associated with males by Hamilton & Morales (1992).

Carystoterpa ikana Hamilton & Morales, 1992 [E]

Type photograph p. 149.

Carystoterpa ikana Hamilton & Morales, 1992: 14. Holotype male (AMNZ); ND, Mangamuka Hills [=Mangamuka Range], forest summit.

Geographic distribution (Map p. 199). North Island: ND–Bay of Islands (Hamilton & Morales, 1992). Kaeo (Hamilton & Morales, 1992). Kaitaia (Hamilton & Morales, 1992). Mangamuka Range (AMNZ). Whangarei Heads (Hamilton & Morales, 1992). WN–Wellington (Hamilton & Morales, 1992). WO–Matamata (NZAC).

Biology. Lowland, montane (lower). Habitat: Unknown. Seasonality: October–March. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Carystoterpa maori Hamilton & Morales, 1992 [E]

Type photograph p. 149.

Carystoterpa maori Hamilton & Morales, 1992: 15. Holotype male (NZAC); BR, Lake Rotoiti, East camping area.

Geographic distribution (Map p. 199). North Island: AK–Titirangi (NZAC), WA, WN. South Island: BR, NC, NN, SD.

Biology. Lowland, montane. Collected on *Coprosma*, long grass, *Nothofagus*, *Sphagnum* (moss). Seasonality: October–March. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Note. The Auckland record appears to stand in isolation, but the North Island distribution of this species may be more extensive than is currently recognised.

Carystoterpa minima Hamilton & Morales, 1992 [E]

Type photograph p. 149.

Carystoterpa minima Hamilton & Morales, 1992: 15. Holotype female (AMNZ); ND, North Cape, Kerr Point.

Geographic distribution (Map p. 200). North Island: ND–North Cape, Kerr Point.

Biology. [Lowland, coastal.] Collected on coastal clifftop vegetation. Seasonality: December. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Carystoterpa minor Hamilton & Morales, 1992 [E]

Type photograph p. 150.

Carystoterpa minor Hamilton & Morales, 1992: 15. Holotype male (NZAC); BP, Rotorua, Blue Lake.

Geographic distribution (Map p. 200). North Island: BP–Blue Lake (NZAC). CL–Coromandel, E of (NZAC). Great Barrier Island, Okiwi (NZAC). Little Barrier Island, Te Maraeroa [Flat] (Hamilton & Morales, 1992). ND–Kohukohu (Hamilton & Morales, 1992). WI–Longacre (NZAC).

Biology. Lowland, montane (lower). Habitat: Unknown. Seasonality: November–March. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Carystoterpa subtacta (Walker, 1858) [E]

Ptyelus subtactus Walker, 1858c: 94. Lectotype* female (designated by Hamilton & Morales, 1992; BMNH); type locality unknown.

Carystoterpa subtacta: Hamilton & Morales, 1992: 16.

Geographic distribution (Map p. 200). Offshore Islands: KE–Macauley Island (Hamilton & Morales, 1992).

Biology. Unknown.

References. Metcalf, 1962a: 71 (catalogue, world; as *Ptyelus subtactus*). Hamilton & Morales, 1992 (distribution, New Zealand, taxonomy).

Notes. According to Hamilton & Morales (1992), this species was described from an unspecified number of individuals, without accession numbers, recorded as coming from West Africa. They believed this record to be erroneous because the genus does not occur in that part of the world. Hamilton & Morales' (1992) lectotype designation was based on the only extant specimen from the type series.

Carystoterpa subvirescens (Butler, 1874) [E]

Ptyelus subvirescens Butler, 1874: 26. Lectotype* male designated by Hamilton & Morales, 1992; BMNH); "54.4" [= North Island, AK, Auckland] (Hamilton & Morales, 1992).

Aphrophora subvirescens: Butler, 1874: Tab.7, Fig. 9.

Philaenus subvirescens: White, 1879: 215.

Carystoterpa subvirescens: Evans, 1966: 323 (as a junior synonym of *C. fingens*).

Carystoterpa subvirescens: Hamilton & Morales, 1992: 16 (resurrected from synonymy with *C. fingens*).

Geographic distribution (Map p. 200). North Island: AK–Auckland (Hamilton & Morales, 1992). ND–Poor Knights Islands (Aorangi (Hamilton & Morales, 1992); Tawhiti Rahi (NZAC)).

Biology. Lowland, coastal. Collected on *Ozothamnus leptophyllus, Coprosma*, *Cortaderia toetoe*, *Cyathodes juniperina* [=*Leptecophylla juniperina*] ferns, grasses, regenerating *Metrosideros*, *Hebe*, *Pseudopanax lessonii*, rushes; coastal vegetation in general. Seasonality: November–December. [Xylem-feeder.] Wing condition: Macropterous.

References. Wise, 1977: 71 (checklist, New Zealand; as a synonym of *C. fingens*). Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Carystoterpa trimaculata (Butler, 1874) [E]

Ptyelus trimaculatus Butler, 1874: 26. Lectotype* male (designated by Hamilton & Morales, 1992; BMNH); New Zealand.

Aphrophora trimaculatus: Butler, 1874: Tab.7, Fig. 10.

Philaenus trimaculatus: White, 1879: 215.

Carystoterpa trimaculata: Lallemand, 1936: 264; Evans, 1966: 323 (as a junior synonym of *C. fingens*).

Carystoterpa trimaculata trimaculata: Lallemand, 1937: 253.

Carystoterpa trimaculata: Hamilton & Morales, 1992: 16 (resurrected from synonymy with *C. fingens*).

Geographic distribution (Map p. 200). Offshore Islands: TH–Great Island (NZAC) (Castaway Camp (NZAC); South East Bay (NZAC)). South West Island (NZAC).

Biology. Lowland, coastal. Collected on *Meryta* [*sinclairii*], *Vitex lucens*. Seasonality: November (mostly)–January. [Xylem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1962a: 554–555 (catalogue, world). Wise, 1977: 71 (checklist, New Zealand; as a synonym of *C. fingens*). Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Note. Myers' (1924a: 179) record of this species for the Chatham Islands refers to *Carystoterpa tristis*.

Carystoterpa tristis (Alfken, 1904) [E]

Ptyelus trimaculatus var. *tristis* Alfken, 1904: 598. Type status and repository unknown. *Aphrophora trimaculata* Butler synonymised with *Ptyelus fingens* Walker by Evans, 1966: 323.

Ptyelus trimaculatus var. *laetus* Alfken, 1904: 598. Type status and repository unknown. *Aphrophora trimaculata* Butler synonymised with *Ptyelus fingens* Walker by Evans, 1966: 323.

Carystoterpa trimaculata tristis: Lallemand, 1937: 253.

Carystoterpa trimaculata laeta: Lallemand, 1937: 253.

Carystoterpa tristis: Hamilton & Morales, 1992: 17 (resurrected from synonymy with *C. fingens*).

Geographic distribution (Map p. 200). Offshore Islands: CH–Chatham Island, several localities (NZAC). Pitt Island, Rangiauria (NZAC). South East Island (NZAC).

Biology. Lowland, coastal. Collected on flowering *Coprosma* (numerous adults and tenerals), *Muehlenbeckia australis*, *Plagianthus*, pasture [vegetation]-ferns, sedges; also coastal vegetation in general. [Hostplant: *Coprosma.*] Seasonality: November–January (mostly), February. [Xylem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1962a: 555–556 (catalogue, world; as *Carystoterpa trimaculata tristis*). Evans, 1966 (taxonomy; as a synonym of *C. fingens*). Wise, 1977: 71 (checklist, New Zealand; as a synonym of *C. fingens*). Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Notes. A series of twelve possible syntypes, involving specimens of both varieties *tristis* and *laeta*, in the Alfken Collection (Ubersee Museum, Germany), were examined by Hamilton & Morales (1992: 17) but these authors had insufficient evidence that these were in fact part of the type series to designate lectotypes. See also **Note** under *C. trimaculata.*

Carystoterpa vagans Hamilton & Morales, 1992 [E]

Type photograph p. 150.

Carystoterpa vagans Hamilton & Morales, 1992: 17. Holotype male (NZAC); BP, Mount Te Aroha.

Geographic distribution (Map p. 200). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. South Island: BR, DN, FD, KA, MC, NC, NN, SC, SD, SL, WD. Stewart Island.

Biology. Lowland, montane (higher). Collected on *Coprosma parviflora*, *Elatostema rugosum*, ferns (at night), *Geniostoma*, *Griselinia*, *Hebe elliptica*, *Leptocarpus* [=*Apodasmia*], *Leptospermum scoparium*, *Melicytus ramiflorus*, *Metrosideros excelsa*, *Nothofagus fusca*, *Olearia arborescens*, *Populus alba*, *Pseudopanax edgerleyi* [=*Raukaua edgerleyi*], *Senecio minimus*, *Syringa vulgaris*, *Vicia faba*; on various coastal shrubs. Seasonality: October–April. [Xylem-feeder.] Wing condition: Macropterous.

Reference. Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Genus *Philaenus* Stål, 1864 [A]

Synonymy (see Hamilton, 1979; Hamilton & Morales, 1992).

Geographic distribution. Oriental Region, Holarctic Region; New Zealand (adventive).

Reference. Hamilton & Morales, 1992 (New Zealand, revision).

Philaenus spumarius (Linnaeus, 1758) [A]

Synonymy (see Metcalf, 1962a; Hamilton & Morales, 1992).

Common name: Meadow Spittlebug.

Geographic distribution (Map p. 200). North Island: HB, TK, TO, WI, WN. South Island: CO, DN, MC, MK, NC, OL, SC; also "2 localities on the west coast" [=WD?] (Lees, 1993). First New Zealand record: WI, Palmerston North, 1960 (Archibald *et al*., 1979). Extralimital range: Holarctic Region.

Biology. Lowland to alpine. Found in a wide range of mostly modified, humid habitats, on a wide variety of plants, including *Cirsium arvense*, *Coriaria*, *Daucus carota*, *Hieracium* (occasionally on *H. pilosella*, commonly on *H. caespitosum, H. lepidulum, H. praealtum*; adults, nymphs), introduced grasses (adults, nymphs), *Lavandula*, *Medicago sativa* crop (adults, nymphs), *Sonchus, Trifolium* crop (adults, nymphs); *Aciphylla, Celmisia*, *Hebe* (all native hostplants in alpine environments); also common on ornamental plants. Seasonality: October–March. Xylem-feeder. Economic importance: May cause damage to crops, pasture and garden plants by direct feeding or by carrying disease organisms, e.g., it is a known vector of Pierce's disease of grapevine caused by the bacterium *Xylella fastidiosa*; heavy infestations of spittle masses are also known to cause damage to legumes. Wing condition: Macropterous.

References. Metcalf, 1962a: 317–361 (catalogue, world; as *Philaenus leucophthalmus spumarius*). Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy). Lees, 1993 (biology, colour polymorphism, distribution). Syrett & Smith, 1998 (biology, New Zealand). Yurtsever, 2000, 2002 (colour polymorphism). Redak *et al*., 2004 (disease vector, epidemiology; *Xylella*).

Notes. *Philaenus spumarius* was introduced in the 1960s – most likely on nursery stock from England (Hamilton & Morales, 1992) – and it has not been recorded from Australia. More information on world distribution, biology, and economic importance may be found in Hamilton (1999a).

Genus *Pseudaphronella* Evans, 1966 [E]

Pseudaphronella Evans, 1966: 324. Type species: *Aphrophora jactator* White, 1879, by original designation.

Geographic distribution. New Zealand.

Reference. Hamilton & Morales, 1992 (New Zealand, revision).

Note. Evans (1966) and Hamilton & Morales (1992) commented that this genus may be related to the Chilean genus *Pseudaphrophora* Schmidt, 1924, and more distantly, to

Anyllis China, 1952, from Australia and *Neotrephes* Stål, 1866a, from South Africa; suggesting a Gondwanan origin for these genera.

Pseudaphronella jactator (White, 1879) [E]

Aphrophora jactator White, 1879: 214. Syntypes* " 'many' specimens of both sexes without collection data, collected by Captain Broun" (BMNH) (Hamilton & Morales, 1992).

Cercopis jactator: Kirkaldy, 1909a: 28.

Pseudaphronella jactator: Evans, 1966: 324.

Geographic distribution (Map p. 200). North Island: BP, CL, GB, HB, RI, TK, TO, WN, WO.

Biology. Montane, subalpine. Collected on *Blechnum* (in *Nothofagus* forest)*, Coprosma, Dracophyllum*, *Nothofagus*, *Olearia ilicifolia*; on subalpine scrub vegetation in general. Seasonality: October–March. [Xylem-feeder.] Wing condition: Macropterous.

References. Evans, 1966 (taxonomy). Wise, 1977: 71 (checklist, New Zealand). Hamilton & Morales, 1992 (biology, distribution, New Zealand, taxonomy).

Note. Hamilton & Morales (1992) reported a female from the South Island "west coast", which may belong to a related undescribed species.

Superfamily CICADOIDEA

Family CICADIDAE

Cicadas

References. Hudson, 1891 (New Zealand, taxonomy), 1893 (New Zealand, nomenclature). Myers, 1921a (New Zealand, revision), 1928b (revision, Samoa). Hudson, 1936 (New Zealand, taxonomy), 1950 (New Zealand, revision). Kato, 1956 (biology, world). Metcalf, 1963a (catalogue, world). Dugdale & Fleming, 1969 (New Zealand, revision; *Amphipsalta*). Dugdale, 1972 (key, genera, New Zealand, revision). Fleming, 1971 (New Zealand, taxonomy; *Maoricicada*), 1973 (New Zealand, revision; *Kikihia cutora*), 1975a (acoustic behaviour, genera, New Zealand), 1975b (biogeography, evolution, New Zealand). Wise, 1977 (checklist, New Zealand). Dugdale & Fleming, 1978 (New Zealand, revision; *Maoricicada*). Fleming, 1984 (New Zealand, revision; *Kikihia,* part). Duffels & Van der Laan, 1985 (catalogue, world). Duffels, 1986 (biogeography, Indo-Pacific). Boulard, 1988 (classification, nomenclature, world). Moulds, 1988 (Australia, taxonomy; *Cicadetta*, *Melampsalta*), 1990 (Australia, identification and field guide). Moulds & Carver, 1991 (Australia, overview; Cicadoidea). Boulard, 1998 (classification, nomenclature, world). Buckley *et al*., 2001a, c (evolution, New Zealand; *Maoricicada*). Buckley *et al*., 2002 (evolution, genera, New Zealand, origin). Simon *et al*., 2003 (acoustic behaviour, biology, distribution, guide, New Zealand). Arensburger *et al*., 2004a (evolution, genera, New Zealand, origin), 2004b (evolution; *Kikihia,* in part). Moulds & Cowan, 2004 (Australia, checklist). Larivière, 2005 (checklist, New Zealand). Moulds, 2005a (Australia, classification, phylogeny, world). Larivière *et al*., 2006 (acoustic behaviour, biology, checklist, distribution, identification guide, New Zealand). Buckley & Simon, 2007 (evolution, New Zealand; *Maoricicada*). Marris, 2007 (New Zealand, popular overview).

Notes. The taxonomy of New Zealand Cicadidae was in a very unsatisfactory state prior to the works of Fleming (mainly 1971, 1973, 1984), Dugdale (1972), and Dugdale & Fleming (1969, 1978). For example, several species were recognised in Palaearctic-Mediterranean genera and contained many undescribed species, or species complexes, and subspecies complexes. Consequently, a great proportion of the literature published before the 1970s contains unreliable records on the nomenclature, taxonomy, biology, and geographic distribution of several New Zealand taxa. Similarly, the works of very early authors (e.g., Stål (1862a), Kirby (1896), Alfken (1904), Distant (1906a)) may not be reliable when considering New Zealand species as these authors did not study the male genitalia nor examine the types. Finally, the literature up to about 1927 also includes many interpretations (and misinterpretations) of the Fabrician species *Tettigonia muta* and *T. cruentata* (e.g., Alfken (1904), Distant (1906a), and also Myers, until the latter author saw the Natural History Museum (BMNH) types in London around 1927). Therefore, most of the information published before the works of Fleming and Dugdale, who have clarified the New Zealand inventory, is not repeated here unless it is for taxa that have not been treated by these authors or for which little other information is available.

Before this catalogue, there was no synonymic checklist or catalogue that recorded the nomenclatural history of New Zealand cicadas in an up-to-date, comprehensive, and accurate manner. The synonymic listings in Metcalf (1963a), Wise (1977), and Duffels & Van der Laan (1985; a supplement to Metcalf 1963a) were only partly useful as they included much of the nomenclatural confusion found in the old literature in the form of numerous citations of little or no nomenclatural significance.

The present catalogue takes a cautious approach towards the listing of synonymic citations and other information on New Zealand taxa, relying mostly on the works

of Fleming & Dugdale and, when available, other more recent publications, in addition to label data associated with authoritatively identified specimens in New Zealand entomological museums and collections. Synonymic citations follow closely Dugdale & Fleming (1969) for *Amphipsalta*; Fleming (1971) for *Maoricicada campbelli, M. iolanthe,* and *M. lindsayi*; Dugdale & Fleming (1978) for *M. cassiope* and *M. oromelaena*; Wise (1977) for *Kikihia muta muta, K. muta pallida, K. rosea*; and Fleming (1984) for *K. ochrina* and *K. subalpina*. The main synonymic citations for other Cicadidae taxa were compiled by the authors.

Subfamily CICADETTINAE

Tribe CICADETTINI

References. Dugdale, 1972 (identification key, New Zealand genera). Moulds, 2005a (classification, phylogeny, subfamily status). Larivière *et al.*, 2006 (identification key, New Zealand genera).

Genus *Amphipsalta* Fleming, 1969 [E]

Amphipsalta Fleming, in Dugdale & Fleming, 1969: 932. Type species: *Cicada zelandica* Boisduval, 1835, by original designation.

Common name: Clapping Cicadas.

Geographic distribution. New Zealand.

References. Dugdale & Fleming, 1969 (revision). Dugdale, 1972 (distribution, species list, taxonomy). Fleming, 1975a (song). Wise, 1977: 71 (checklist, New Zealand). Duffels & Van der Laan, 1985: 294–296 (catalogue, world). Larivière *et al.*, 2006 (guide to species, identification).

Amphipsalta cingulata (Fabricius, 1775) [E]

Tettigonia cingulata Fabricius, 1775: 680. Lectotype* male (designated by Dugdale & Fleming, 1969; BMNH); "Nova Zelandia" = [ND] Bay of Islands (Dugdale & Fleming, 1969).
Melampsalta cingulata: Myers, 1921a: 241 (part).
Cicadetta cingulata: Metcalf, 1963a: 302 (part).
Amphipsalta cingulata: Dugdale & Fleming, 1969: 943.

Common name: Clapping Cicada.

Geographic distribution (Map p. 209). North Island: AK, BP, CL, HB, ND, TK, TO, WA, WI, WN, WO. Offshore Islands: TH.

Biology. Lowland, mostly coastal. Collected in coastal scrub (e.g., under *Muehlenbeckia*), lakeshore or forest-margin scrub rather than forests; also in gardens, in orchards (e.g., kiwifruit), on introduced trees, lamp posts and buildings; taken once from *Meryta* roots. Seasonality: October–June. Solo singer (usually). Xylem-feeder. Wing condition: Submacropterous. Economic importance: After *A. zelandica*, this is the second most important pest species in coastal kiwifruit orchards (BP).

References. Myers, 1929b (taxonomy; as *Melampsalta cingulata*). Hudson, 1950 (taxonomy; as *Melampsalta cingulata*). Metcalf, 1963a: 302–305 (catalogue, world; as *Cicadetta cingulata*). Dugdale & Fleming, 1969 (biology, distribution, song, taxonomy). Dugdale, 1972 (distribution, nomenclature). Fleming, 1975b (biology, distribution). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 294–295 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Logan & Connolly, 2005 (biology, economic importance, nymphal exuviae).

Notes. Most nomenclatural combinations and information associated with *Amphipsalta cingulata* (Fabricius) up to about 1969 may also apply, at least in part, to *Amphipsalta strepitans* or *Amphipsalta zelandica. Amphipsalta cingulata* has also been erroneously recorded for New Zealand by early authors under other names such as *Cicada mendosa* Walker (West Africa), *C. indivulsa* Walker, or *C. flexicosta* Walker (Australia). Additional information on distribution and biology can be found in works cited under **References**.

Amphipsalta strepitans (Kirkaldy, 1909) [E]

Type photograph p. 164.
Cicada cingulata var. *obscura* Hudson, 1891: 51. Lectotype female (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); KA, Kekerangu [=Kekerengu], Dee River [=Dee Stream]. Preoccupied.
Melampsalta obscura: Hutton, 1904: 224.
Cicadetta strepitans Kirkaldy, 1909a: 28. Replacement name for *Cicada cingulata* var. *obscura*.
Melampsalta strepitans: Myers, 1921a: 241.
Amphipsalta strepitans: Dugdale & Fleming, 1969: 949.

Common name: Chirping Cicada.

Geographic distribution (Map p. 209). North Island: HB, WA, WN. South Island: CO, KA, MB, MC, MK, NC, NN, SC, SD.

Biology. Lowland (often coastal) to montane. Collected in coastal or riparian habitats, on rock-faces and in shrubland (e.g., *Discaria, Ozothamnus*) but not forest; on cliff faces and screes; also in gardens, on *Phormium* and on various shrubs. Seasonality: October–March. Observed singing on rock faces during the day; [solo-singer]. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta strepitans*). Hudson, 1950 (taxonomy; as *Melampsalta*

strepitans). Metcalf, 1963a: 382–383 (catalogue, world; as *Cicadetta strepitans*). Dugdale & Fleming, 1969 (biology, distribution, song, taxonomy). Dugdale, 1972 (distribution, nomenclature). Fleming, 1975b (biology). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 295–296 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. The specific name *strepitans* was placed on the Official List of Specific Names in Zoology by Melville (1979). The lectotype is a female, not a male as stated in Fleming & Ordish (1966) (J. S. Dugdale, personal communication based on type examination). Additional information on distribution and biology can be found in works cited under **References**. See also **Notes** under *A. cingulata*.

Amphipsalta zelandica (Boisduval, 1835) [E]

Cicada zelandica Boisduval, 1835: 611, Atlas pl. 10, fig. 6. Holotype* female (MNHP; presumed lost or destroyed); "Nouvelle-Zélande" = [NN] Tasman Bay (Dugdale & Fleming, 1969).
Melampsalta cingulata: Myers, 1921a: 241 (part).
Amphipsalta zelandica: Dugdale & Fleming, 1969: 937.

Common names: Chorus Cicada, Kihikihi wa wa.

Geographic distribution (Map p. 209). North Island: AK, BP, CL, GB, HB, ND, TK, TO, WA, WI, WN, WO. South Island: BR, DN, FD, KA, MB, MC, NC, NN, OL, SC, SD, SL, WD. Stewart Island. Offshore Islands: TH.

Biology. Lowland (mostly), montane. Collected in indigenous forests (podocarp, broadleaf, *Nothofagus*, mixed), exotic forests (e.g., *Eucalyptus*), shelterbelts, gardens, orchards (e.g., kiwifruit); on various trees and shrubs; also on lampposts and buildings. Seasonality: November–August, mostly late January–March. Emerging in large numbers at times, e.g., in March. Chorus singer, diurnal (singing at dawn) and nocturnal, e.g., sings or claps in unison on warm humid nights. Xylem-feeder. Wing condition: Submacropterous. Attracted to artificial lights. Economic importance: Main cicada pest species of New Zealand kiwifruit orchards (vines damaged by egg-laying, workers disrupted by song and repeated contact with flying cicadas).

References. Metcalf, 1963a: 302–305 (catalogue, world; in the synonymy of *Cicadetta cingulata*). Dugdale & Fleming, 1969 (biology, distribution, song, taxonomy). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 296 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Logan & Connolly, 2005 (biology, economic importance, nymphal exuviae).

Notes. The Maori name "Kihikihi wa wa" was wrongly applied to *Amphipsalta cingulata* by Scott & Emberson (1999). Additional information on distribution and biology can be found in works cited under **References**. See also **Notes** under *A. cingulata.*

Genus *Kikihia* Dugdale, 1972 [N]

Kikihia Dugdale, 1972: 874. Type species: *Cicada muta* var. *sub-alpina* Hudson, 1891, by original designation.
Common name: Kikihi.

Geographic distribution. Australia (Norfolk Island only), New Zealand (main islands, Kermadec Islands, Chatham Islands).

References. Dugdale, 1972 (distribution, New Zealand, species list, taxonomy). Fleming, 1973 (biology, distribution, New Zealand, song, taxonomy; *K. cutora*), 1975a (song). Wise, 1977: 73 (checklist, New Zealand). Fleming, 1984 (New Zealand, revision (part.)). Duffels & Van der Laan, 1985: 303–307 (catalogue, world). Arensburger *et al*., 2004b (phylogeny; except *K. dugdalei, K. laneorum, K. muta*). Moulds & Cowan, 2004 (Australia, checklist). Larivière *et al.*, 2006 (guide to New Zealand species, identification).

Notes. The genus *Kikihia* is currently known from 16 taxa in New Zealand (13 species and three subspecies) and a single species from Norfolk Island (*K. convicta* (Distant)). Fleming (1973, 1984) began revising *Kikihia* but only completed the treatment of seven species, the "vivid green foliage cicadas" *sensu* Fleming (*K. cutora*, *K. dugdalei, K. horologium, K. laneorum, K. ochrina, K. paxillulae, K. subalpina*), before his death in 1987. This left six species to be revised: the "North Island shade singers" *sensu* Fleming (*K. cauta, K. scutellaris*) and the "grass and scrub cicadas" *sensu* Fleming (*K. angusta*, *K. longula, K. muta, K. rosea*). There remained the possibility of discovering several new undescribed taxa. Since Fleming's work, no one has published on the taxonomy of this genus which, once revised, may be the most diverse cicada genus in New Zealand, according to Arensburger *et al*. (2004b), with an estimated 28 species in all.

Kikihia angusta (Walker, 1850) [E]

Cicada angusta Walker, 1850: 174. Type status uncertain, apparently described from one specimen by Walker (1850) "a. — ? From Earl's collection." (BMNH, probably); type locality probably Waikouaiti (DN). See also **Notes**.
Melampsalta angusta: White, 1879: 214.
Melampsalta muta angusta: Kirby, 1896: 456.
Cicadetta angusta: Kirkaldy, 1909a: 28.
Kikihia angusta: Dugdale, 1972: 875.

Common name: Tussock Cicada.

Geographic distribution (Map p. 209). South Island: BR, CO, DN, FD, MB, MC, MK, NC, OL, SC, SL. Stewart Island.

Biology. Lowland to subalpine. Collected mostly in tussock grasslands (e.g., snow tussock); in *Aciphylla* habitats; also recorded on *Dactylis glomerata* and *Medicago sativa.* Seasonality: January–March. Xylem-feeder. Wing condition: Submacropterous.

References. Hudson, 1950 (taxonomy; as *Melampsalta muta* var. *angusta*). Metcalf, 1963a: 357–358 (catalogue, world; as *Cicadetta muta angusta*). Dugdale, 1972 (distribution, nomenclature). Fleming, 1975b (biology, distribution), 1975c (biology). Wise, 1977: 73 (checklist, New Zealand). Duffels & Van der Laan, 1985: 303 (catalogue, world). Simon *et al*., 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. The British Museum's collection register for Percy Earl are 45/30, 45/50, 45/93; most of these specimens were collected around Waikouaiti north of Dunedin (J. S. Dugdale, personal communication). This species may have been recorded under other names, at least in part, in the early literature (e.g., *Melampsalta cruentata* – Myers, 1921a, *M. muta muta* – Myers, 1926a, *M. muta* – Myers, 1927). Additional information on distribution and biology can be found in works cited under **References**.

Kikihia cauta (Myers, 1921) [E]

Melampsalta cauta Myers, 1921a: 242. Syntypes* (MONZ, Hudson Collection); " [TO] Ohakune; [WN] Karori, Day's Bay, Wellington" (Myers, 1921a). See also **Notes**.
Cicadetta cauta: Metcalf, 1963a: 301.
Kikihia cauta: Dugdale, 1972: 875.

Common name: Greater Bronze Cicada.

Geographic distribution (Map p. 210). North Island: AK, BP, CL, ND, RI, TO, WN.

Biology. Lowland (mostly), montane (lower). Found in forests, often in hilly regions; on various trees and shrubs (often high in the canopy), but apparently not on *Melicytus ramiflorus* in areas of sympatry with *K. scutellaris*; also collected on tree trunks and logs. Seasonality: November–March. Shade-singer (singing in dense forest rather than in full sun). Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta cauta*). Hudson, 1950 (taxonomy; as *Melampsalta cauta*). Metcalf, 1963a: 301 (catalogue, world; as *Cicadetta cauta*). Dugdale, 1972 (distribution, nomenclature). Fleming, 1975b (biology, distribution). Wise, 1977: 73 (checklist, New Zealand). Duffels & Van der Laan, 1985: 303 (catalogue, world). Simon *et al*., 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. MONZ has Hudson specimens of *Melampsalta cauta* collected prior to 1921 from the type localities; they may be part of the type series. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia cutora cumberi Fleming, 1973 [E]

Type photograph p. 164.
Kikihia cutora cumberi Fleming, 1973: 324. Holotype male (MONZ); TO, Mangatawai Stream, S[tate] H[ighway] 1.

Common name: Southern Snoring Cicada.

Geographic distribution (Map p. 210). North Island: AK, BP, CL, GB, HB, TK, TO, WA, WI, WN, WO.

Biology. Lowland to subalpine. Collected in similar habitat to that of *K. cutora cutora*, that is, foliage of various broadleaf trees and shrubs, coastal scrub, and grass but extending to the subalpine scrub vegetation (e.g., *Ozothamnus leptophyllus*, *Hebe, Podocarpus nivalis*). Seasonality: November–June, mostly February–April; rarely emerging before mid-December. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1973 (biology, distribution, song, taxonomy). Wise, 1977: 73 (checklist, New Zealand). Fleming, 1984 (distribution, taxonomy). Duffels & Van der Laan, 1985: 304 (catalogue, world). Lane, 1995 (hybridization). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia cutora cutora (Walker, 1850) [E]

Cicada cutora Walker, 1850: 172. Holotype* female (BMNH); type locality undetermined.
Melampsalta cuterae [*sic*]: Kirby, 1896: 456.
Melampsalta cutora: Hutton, 1898b: 181.
Cicadetta cutora: Kirkaldy, 1909a: 28.
Melampsalta muta cutora: Myers, 1926a: 75.
Cicadetta muta var. *cutora*: Metcalf, 1963a: 359.
Kikihia cutora: Dugdale, 1972: 875.
Kikihia cutora cutora: Fleming, 1973: 322.

Common names: Northern Snoring Cicada.

Geographic distribution (Map p. 210). North Island: AK, CL, ND, WO.

Biology. Lowland, mostly coastal. Found mostly on the foliage of broadleaf shrubs and trees, e.g., *Coprosma repens, Hebe*, *Leptospermum scoparium, Metrosideros excelsa*, *Myoporum laetum*, *Pittosporum*; on vines, especially *Muehlenbeckia,* also *Convolvulus* or *Calystegia* [*soldanella*], and locally on the grass *Pennisetum clandestinum*; also collected on *Agathis australis*, general coastal scrub vegetation, *Phormium* (in swamp), steep *Cortaderia* swards.

Seasonality: Throughout the year, mostly January–March (rarely June–August). Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta muta* var. *cutora*). Hudson, 1950 (taxonomy; as *Melampsalta muta* var. *cutora*). Metcalf, 1963a: 359–360 (catalogue, world; as *Cicadetta muta cutora*). Dugdale, 1972 (distribution, nomenclature; as *K. cutora*). Fleming, 1973 (biology, distribution, song, taxonomy). Wise, 1977: 73 (checklist, New Zealand; as *K. cutora* and *K. cutora cutora*). Fleming, 1984 (distribution, taxonomy). Duffels & Van der Laan, 1985: 304 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. Various applications of the epithet *subalpina* made by Myers prior to 1927, as subspecies or full species, to *K. cutora* (including Kermadec Islands populations now known as *K. cutora exulis*) should be disregarded because Myers then had not seen Walker's type of *Cicada cutora* (BMNH). The history of these name applications, as well as the respective views of Hudson and Myers about what should have then been regarded as true "*cutora*", have been reported in great detail by Fleming (1973), including Hudson's (1950) concept that North Island specimens of var. *cutora* (*sensu* Myers) could be hybrids (*Melampsalta muta* x *M. ochrina*). Additional information on distribution and biology can be found in works cited under **References**.

Kikihia cutora exulis (Hudson, 1950) [E]

Type photograph p. 165.

Melampsalta exulis Hudson, 1950: 137. Lectotype male (designated by Fleming & Ordish, 1966; MONZ); Kermadec Islands.

Cicadetta exulis: Metcalf, 1963a: 312.

Kikihia exulis: Dugdale, 1972: 875.

Kikihia cutora exulis: Fleming, 1973: 326.

Common name: Kermadec Cicada.

Geographic distribution (Map p. 210). Offshore Islands: KE (Dugdale, 1972)–Raoul Island (Fleming, 1973, 1984; Arensburger *et al.*, 2004b).

Biology. Lowland, coastal. Collected on coastal shrubs and trees, including *Myoporum*. Seasonality: August–March. Xylem-feeder. Wing condition: Submacropterous with forewings proportionately longer than in most *Kikihia* except *K. convicta* (Norfolk Island), *K. longula,* and *K. scutellaris*.

References. Hudson, 1950 (taxonomy; as *Melampsalta exulis*). Metcalf, 1963a: 312 (catalogue, world; as *Cicadetta exulis*). Dugdale, 1972 (distribution, nomenclature; as *K. exulis*). Fleming, 1973 (biology, distribution, taxonomy). Wise, 1977: 73 (checklist, New Zealand). Fleming, 1984: 197 (distribution, taxonomy). Duffels & Van der Laan, 1985: 304 (catalogue, world). Arensburger *et al.*, 2004b (distribution). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Notes. When Hudson (1950) named *Melampsalta exulis*, he stated that *M. muta* var. *subalpina* "also occurs on the Kermadecs", but it is recognised that only *K. cutora exulis* occurs there. See also **Notes** under *K. cutora cutora*. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia dugdalei Fleming, 1984 [E]

Type photograph p. 165.

Kikihia dugdalei Fleming, 1984: 198. Holotype male (NZAC); BP, Rotorua, Whakarewarewa.

Common name: Dugdale's Cicada.

Geographic distribution (Map p. 210). North Island: AK, BP, GB, ND, TO, WN, WO.

Biology. Lowland. Inhabits native forest margins (including cutover and regenerating forests) and scrublands where adults are almost confined to the shrubs *Cyathodes juniperina* [=*Leptecophylla juniperina*] and *C. fasciculata* [=*Leucopogon fasciculatus*] where males sing, mating occurs, and females probably lay eggs; adults also reported singing on *Leptospermum scoparium*, *Kunzea ericoides*, *Escallonia*, *Sambucus* 'Aurea', and *Teline monspessulana*; appears not to favour introduced trees such as *Populus* and *Quercus* which apparently attract its close relative *K. ochrina*, nor *Coprosma.* Seasonality: late September–February; emerging about four weeks earlier than *K. ochrina*. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (biology; as *Kikihia* sp. V), 1984 (biology, distribution, song, taxonomy). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia horologium Fleming, 1984 [E]

Type photograph p. 166.

Cicada muta var. *flavescens* Hudson, 1891: 52. Holotype female (MONZ, Hudson Collection); KA, Mount Tapuaewaeonuku [=Tapuae-o-Uenuku] lower slopes. Preoccupied. [Stated to be a nomen dubium.]

Melampsalta muta flavescens: Kirby, 1896: 456.

Melampsalta flavescens: Hutton, 1904: 224.

Melampsalta muta var. *flavescens*: Hudson, 1950: 139.

Cicadetta muta flavescens: Metcalf, 1963a: 360.

Kikihia horologium Fleming, 1984: 199. Replacement name for *Cicada muta* var. *flavescens*. Holotype male (MONZ); MK, Kea Point Track, Mount Cook National Park.

Common name: Clock Cicada.

Geographic distribution (Map p. 210). South Island: BR, KA, MB, MC, MK, NC, NN, WD.

Biology. Montane (upper), subalpine. Found on subalpine scrub vegetation (e.g., *Aciphylla*, *Ozothamnus, Hebe* (a common singing station)), and below the tree line in habitats such as screes, riverbeds, and revegetating landslide areas. Seasonality: November–April, mostly January–February, less abundant in March. Xylem-feeder. Wing condition: Submacropterous.

References. Hudson, 1950 (taxonomy; as *Melampsalta muta* var. *flavescens*). Fleming, 1975b (biology; as *Kikihia* sp. 7), 1984 (biology, distribution, song, taxonomy). Simon *et al*., 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. Fleming (1984) judged the female holotype of *Cicada muta* var. *flavescens* to be taxonomically inadequate, hence the designation of new type material to establish the new replacement name *Kikihia horologium.* For further explanation see *Recommendation 60A of the International Code of Zoological Nomenclature* (International Commision on Zoological Nomenclature, 1999). From 1891 to 1950, Hudson and Myers included this species within their concept of *"Melampsalta muta* var. *subalpina*". According to Fleming (1984), *K. subalpina* and *K. horologium* can be sympatric in the northern and central South Island subalpine areas, which may explain why they have long been regarded as mere varieties of the morphologically highly variable species *Melampsalta* (or *Cicada*) *muta* (Fabricius). Additional information on distribution and biology can be found in works cited under **References**.

Kikihia laneorum Fleming, 1984 [E]

Type photograph p. 166.

Kikihia laneorum Fleming, 1984: 195. Holotype male (MONZ): TO, Opepe Historical Reserve, Taupo-Napier Highway.

Common name: Lanes' Cicada.

Geographic distribution (Map p. 210). North Island: AK, CL, GB, RI, TK, TO, WN.

Biology. Lowland (often coastal) to lower montane. Found in forest and associated tall *Leptospermum* shrubland, mostly in tall podocarp-broadleaf or beech-dominated forest; sings predominantly in canopy, less so on understorey trees in lightwells and forest margins (J. S. Dugdale, personal communication). Seasonality: October–June, mostly December–March. Shade-singer (mostly). Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (taxonomy; as *Kikihia* sp. L), 1984 (biology, distribution, song, taxonomy). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia longula (Hudson, 1950) [E]

Type photograph p. 167.

Melampsalta muta var. *longula* Hudson, 1950: 139. Lectotype male (designated by Fleming & Ordish, 1966; CMNZ); CH, Pitt Island.

Kikihia longula: Dugdale, 1972: 875; Wise, 1977: 73.

Kikihia muta longula: Fleming, 1973: 316.

Common name: Chathams Cicada.

Geographic distribution (Map p. 210). Offshore Islands: CH–Chatham, Pitt, Mangere Islands: several sites (NZAC).

Biology. Lowland (coastal and inland). In pasture, roadsides, coastal shrub/grasslands including dunes; singing stations on vegetation in sun, also (Pitt Island) on sunny trunks or large branches (J. S. Dugdale, personnal communication). Seasonality: November–February, mostly January–February. Xylem-feeder. Wing condition: Submacropterous with forewings proportionately longer than most *Kikihia* except *K. convicta* (Norfolk Island), *K. cutora exulis,* and *K. scutellaris*.

References. Hudson, 1950 (taxonomy; as *Melampsalta muta* var. *longula*). Metcalf, 1963a: 360 (catalogue, world; as *Cicadetta muta longula*). Dugdale, 1972 (distribution, nomenclature). Fleming, 1973 (distribution). Wise, 1977: 73 (checklist, New Zealand). Duffels & Van der Laan, 1985: 304–305 (catalogue, world). Arensburger *et al*., 2004b (distribution). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Notes. This species may have been recorded from the Chatham Islands under other names such as *Melampsalta cruentata* – Hutton, 1898a, *M. muta* var. *subalpina* – Kirkaldy, 1909a, *M. muta* var. *muta* – Myers, 1929b. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia muta muta (Fabricius, 1775) [E]

Tettigonia muta Fabricius, 1775: 681. Holotype* female (BMNH) (Simon *et al.*, 2003); [SD] Ship Cove (Simon *et al*., 2003).

Cicada muta: Goeze, 1778: 150.

Cicada bilinea Walker, 1858a: 34. Type status uncertain (presumed repository BMNH); Walker's original description based on a female specimen "a. New Zealand. From Mr. Earl's collection." Synonymised by Stål, 1862a: 484.

Melampsalta muta: Stål, 1862a: 484.

Melampsalta muta var. *muta*: Kirby, 1896: 455.

Cicadetta muta: Kirkaldy, 1909a: 27 (part).

Melampsalta fuliginosa Myers, 1921a: 245. Holotype female (MONZ, Hudson Collection); WN, Wellington. Synonymised by Hudson, 1950: 141.

Kikihia muta: Dugdale, 1972: 875.

Common names: Variable Cicada (adults), Kihikihi kai (nymphs).

Geographic distribution (Map p. 210). North Island: RI, TK, WA, WI, WN. South Island: BR, DN, KA, MB, MC, NC, NN, OL, SD, WD.

Biology. Lowland to subalpine. Collected mostly on monocots, e.g., *Carex*, grasses (including pasture or coastal sand dune grasses) and *Phormium*, often in marshy or humid environments; also occasionally collected on various low herbage, sometimes on shrubs. Seasonality: October–April, mostly December–February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta muta* var. *muta*, *M. fuliginosa*). Hudson, 1950 (taxonomy; as *Melampsalta fuliginosa*). Metcalf, 1963a: 360–362 (catalogue, world; as *Cicadetta muta muta*). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 74 (checklist, New Zealand). Duffels & Van der Laan, 1985: 305 (catalogue, world; as *Kikihia muta*). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Notes. This taxon has been erroneously recorded in the early literature under the specific name *cruentata*. Arensburger *et al*. (2004b) reported that *K. muta* appears to form a complex of several species and/or subspecies. Consequently, information presented here for *K. muta* and its subpecies may be less reliable than for other *Kikihia* taxa. Simon *et al*. (2003) cited "Ship Cove" as the type locality based on notes by Fleming and on advice by Dugdale as being the most likely site (J. S. Dugdale, personal communication). Additional information on distribution and biology can be found in works cited under **References**.

Kikihia muta pallida (Hudson, 1950) [E]

Type photograph p. 167.

Melampsalta muta var. *pallida* Hudson, 1950: 139. Lectotype male (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); MK, Sealy Range, Mount Cook.
Cicadetta muta var. *pallida*: Metcalf, 1963a: 362.
Melampsalta muta pallida: Fleming & Ordish, 1966: 199.
Kikihia muta pallida: Wise, 1977: 74.

Common name: None; taxonomic status dubious (see **Note**).

Geographic distribution (Map p. 211). North Island: WN–Mount Holdsworth (Hudson, 1950). South Island: CO–Mount Ida (Hudson, 1950). MC–Cass (Hudson, 1950). MK–Mount Cook (Hudson, 1950). OL–Ben Mohr [=Ben More] (Hudson, 1950).

Biology. Montane, subalpine. [Tussock and shrubland.] Seasonality: December, January, February (mostly). Xylem-feeder. Wing condition: Submacropterous.

References. Hudson, 1950 (taxonomy; as *Melampsalta muta* var. *pallida*). Metcalf, 1963a: 362 (catalogue, world; as *Cicadetta muta pallida*). Wise, 1977: 74 (checklist, New Zealand). Duffels & Van der Laan, 1985: 305 (catalogue, world). Larivière, 2005 (checklist, New Zealand).

Note. This taxon may be conspecific with *Kikihia angusta*.

Kikihia ochrina (Walker, 1858) [E]

Cicada ochrina Walker, 1858a: 34. Holotype* apparently male (BMNH); New Zealand = AK, Auckland (Fleming, 1984).
Cicada aprilina Hudson, 1891: 53. Lectotype male (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); WN, Wellington Botanical Gardens. Synonymised by Myers, 1927: 687.
Cicadetta ochrina: Kirkaldy, 1909a: 28.
Melampsalta ochrina: Myers, 1927: 687.
Kikihia ochrina: Dugdale, 1972: 875.

Common name: April Green Cicada.

Geographic distribution (Map p. 211). North Island: AK, BP, ND, TK, TO, WN. South Island: MC–Christchurch (probably introduced; Hill *et al*., 2005). Offshore Islands: TH (unconfirmed).

Biology. Lowland, montane (lower). Collected on a wide range of native broadleaf shrubs and trees, usually at the forest margin, e.g., on *Coprosma, Hebe, Melicytus, Myoporum, Pseudopanax*, which are commonly used as singing stations, as well as on some introduced trees and shrubs, and in kiwifruit orchards. Hostplants: *Melicytus ramiflorus* and other native trees and shrubs. Seasonality: October–July, mostly February–April; emerging about four weeks later than *K. dugdalei*. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta ochrina*). Hudson, 1950 (taxonomy; as *Melampsalta ochrina*). Metcalf, 1963a: 364–365 (catalogue, world; as *Cicadetta ochrina*). Dugdale, 1972 (distribution, nomenclature). Fleming, 1973 (taxonomy; as *Cicada ochrina*), 1975b (biology, song). Wise, 1977: 74 (checklist, New Zealand). Fleming, 1984 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 305–306 (catalogue, world). Hill *et al.*, 2005 (biology, distribution). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Logan & Connolly, 2005 (biology, nymphal exuviae).

Notes. According to Fleming (1984), the suspected occurrence of this species on the Three Kings and other outlying islands needs confirmation. This taxon may be closely related to *K. dugdalei*. Additional information on distribution and biology can be found in works cited under **References**. See also **Biology** under *K. dugdalei*.

Kikihia paxillulae Fleming, 1984 [E]

Type photograph p. 168.

Kikihia paxillulae Fleming, 1984: 201. Holotype male (MONZ); KA, Charwell Forks School.

Common name: Peg's Cicada.

Geographic distribution (Map p. 211). South Island: KA, NC–Coldstream, N of Lower Wairau [*sic*] Bridge [=Hawkswood Stream, lower Waiau Valley] (NZAC).

Biology. [Lowland, montane (lower).] Collected on grasses (including long pasture grass), herbs, and shrubs. Seasonality: December–March. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1984 (biology, distribution, song, taxonomy). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. Knuckle Hill, Westhaven Inlet (NN) specimens in NZAC probably belong to an undescribed taxon. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia rosea (Walker, 1850) [E]

Cicada rosea Walker, 1850: 220. Syntypes* status uncertain (BMNH); Walker's original description indicates that the species is based on two specimens, "a, b. New Zealand. From Mr. Earl's collection."; Simon *et al.* (2003) list the type [=syntypes] as collected by Percy Earl in 1840s probably near Waikouaiti Whaling Station [DN].

Melampsalta rosea: Stål, 1862a: 484.

Cicada muta var. *cinerescens* Hudson, 1891: 52. Type status uncertain (type or syntypes could not be found by Fleming & Ordish (1966) in Hudson's collection). Synonymised by Kirkaldy, 1909a: 28.

Cicadetta rosea: Kirkaldy, 1909a: 28.

Kikihia rosea: Dugdale, 1972: 875.

Common names: Pink Cicada, Murihiku Cicada.

Geographic distribution (Map p. 211). South Island: CO, DN, FD, MC, MK, OL, SL, WD. Stewart Island.

Biology. Lowland (often coastal) to subalpine. Collected on grass (including roadside grass), in *Hebe-Dacrydium* [=*Halocarpus*] bog, on *Leptospermum, Olearia*, scrub vegetation, *Senecio,* tussock; also on tree line vegetation. Seasonality: November–April, mostly January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Metcalf, 1963a: 360–362 (catalogue, world; synonymy of *Cicadetta muta muta*). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 74 (checklist, New Zealand). Duffels & Van der Laan, 1985: 306 (catalogue, world). Simon *et al.*, 2003 (distribution). Larivière, 2005 (checklist, New Zealand).

Notes. This taxon has been variously recorded under other names in the past, in part or in error (e.g., *Melampsalta angusta* – White, 1879, *Melampsalta cruentata* – Hutton, 1898b, *Melampsalta muta* var. *muta* – Myers, 1926a, *Melampsalta muta* – Myers, 1927*, Cicadetta muta* var. *muta* – Metcalf, 1963a). Fleming referred to this species informally as Murihiku Cicada, as he informally used the Maori name for the region (J. S. Dugdale, personal communication); this common name is retained here. Additional information on distribution and biology can be found in works cited under **References**.

Kikihia scutellaris (Walker, 1850) [E]

Cicada scutellaris Walker, 1850: 150. Holotype* apparently male (Kirby, 1896) (presumed repository BMNH); "a. New Zealand. From Mr Earl's collection." (Walker, 1850: 150).

Melampsalta scutellaris: Stål, 1862a: 484.

Cicada tristis Hudson, 1891: 52. Lectotype male (NZAC; designated by Fleming & Ordish, 1966: 198); WN, Karori. Synonymised by Distant, 1906a: 172.

Cicadetta scutellaris: Alfken, 1904: 582.

Kikihia scutellaris: Dugdale, 1972: 875.

Common name: Lesser Bronze Cicada.

Geographic distribution (Map p. 211). North Island: AK, BP, CL, HB, TK, TO, WA, WI, WN. South Island: MB (Hill *et al*., 2005), SD.

Biology. Lowland (often coastal), montane (lower). Found in forests, almost exclusively on *Melicytus ramiflorus*. Males also singing from the canopy of kiwifruit in orchards. Shade-singer (singing in dense forest rather than in full sun). Seasonality: October–April, mostly January–February. Xylem-feeder. Wing condition: Submacropterous with forewings proportionately longer than in most *Kikihia* except *K. convicta* (Norfolk Island)*, K. cutora exulis, K. longula*. Attracted to artificial lights.

References. Myers, 1929b (taxonomy; as *Melampsalta scutellaris*). Hudson, 1950 (taxonomy; as *Melampsalta scutellaris*). Metcalf, 1963a: 375–376 (catalogue, world; as *Cicadetta scutellaris*). Dugdale, 1972 (distribution, nomenclature). Fleming, 1975b (biology, distribution). Wise, 1977: 74 (checklist, New Zealand). Duffels & Van der Laan, 1985: 306 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Hill *et al*., 2005 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Logan & Connolly, 2005 (biology, nymphal exuviae).

Notes. The holotype of *Cicada scutellaris* would be from the first part of Percy Earl's sojourn in New Zealand (see Andrews (1986) for details of Earl's activities in New Zealand from 1842 to 1844) and joins other insect specimens with an obvious Wellington or Hutt Valley provenance (J. S. Dugdale, personal communication). *Kikihia scutellaris* was not known from the South Island prior to the Picton-Wellington rail-ferry service. Metcalf (1963a) cited *Cicada*

arche Walker, described from Australia as a synonym of *scutellaris* but, as already established by Myers (1921a: 248), the two taxa are not conspecific. Additional information on distribution and biology can be found in works cited under **References**. See also **Biology** under *K. cauta*.

Kikihia subalpina (Hudson, 1891) E

Type photograph p. 168.

Cicada muta var. *sub-alpina* Hudson, 1891: 52. Lectotype female (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); WN, Karori, Wellington.

Cicada muta var. *rufescens* Hudson, 1891: 52. Lectotype male (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); WN, Karori, Wellington. Synonymised by Fleming & Ordish, 1966: 199.

Melampsalta cruentata var. *sub-alpina*: Myers, 1921a: 244. Placement based on Myers' misconception of Walker's *cruentata* (J. S. Dugdale, personal communication).

Melampsalta subalpina: Myers & Myers, 1924: 425.

Melampsalta muta var. b. *subalpina*: Myers, 1926a: 74.

Melampsalta muta var. *subalpina*: Myers, 1927: 687.

Melampsalta muta var. *callista* Hudson, 1950: 138. Lectotype female (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); WN, Mount Holdsworth lower slopes. Synonymised by Fleming & Ordish, 1966: 199.

Cicadetta subalpina: Dugdale & Fleming, 1969: 954.

Kikihia subalpina: Dugdale, 1972: 875.

Common name: Subalpine Green Cicada.

Geographic distribution (Map p. 211). North Island: GB, HB, RI, TK, TO, WN. South Island: BR, DN, FD, KA, MC, MK, NN, OL, SC, SD, WD. Stewart Island.

Biology. Lowland to subalpine (mostly montane to subalpine, North Island). Found on subalpine scrub vegetation (e.g., *Hebe*, *Ozothamnus, Phyllocladus alpinus*, *Podocarpus nivalis*), sometimes also in the canopy of *Nothofagus solandri cliffortioides* (central North Island); in scrubland on ridges down to about 100 m elevation (lower North Island); in forest canopy (e.g., *Nothofagus*, exotic plantations) from tree line to sea level, but rarely in true subalpine environments (South Island). Seasonality: December, January (mostly), February–April. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta muta* var. *subalpina*). Hudson, 1950 (taxonomy; as *Melampsalta muta* var. *sub-alpina*). Metcalf, 1963a: 363 (catalogue, world; as *Cicadetta muta subalpina*). Dugdale, 1972 (distribution, nomenclature). Fleming, 1975b (biology, distribution). Wise, 1977: 74–75 (checklist, New Zealand). Fleming, 1984 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 306–307 (catalogue, world). Lane, 1995 (hybridization). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. South Island populations currently referred to *K. subalpina* may represent another taxon. Additional information on distribution and biology can be found in works cited under **References**. See also **Notes** under *K. horologium*.

Genus *Maoricicada* Dugdale, 1972 E

Maoricicada Dugdale, 1972: 875. Type species: *Melampsalta campbelli* Myers, 1923b, by original designation.

Common name: Black Cicadas.

Geographic distribution. New Zealand.

References. Dugdale, 1972 (distribution, species list, taxonomy). Fleming, 1975a (song). Wise, 1977: 75 (checklist, New Zealand). Dugdale & Fleming, 1978 (revision). Duffels & Van der Laan, 1985: 307–311 (catalogue, world). Buckley *et al*., 2001a, c (evolution), 2002 (biology, evolution), 2006 (evolution). Larivière *et al.*, 2006 (guide to species, identification). Buckley & Simon, 2007 (evolution). Hill *et al*., 2009 (evolution).

Notes. This genus was revised first by Fleming(1971), and later by Dugdale & Fleming (1978), bringing the known fauna to 19 known taxa (14 species, five subspecies). Buckley *et al*. (2002) established the monophyly of the genus and also suggested, through mitochondrial DNA sequence analysis, that cryptic species may be present in *Maoricicada*. Arensburger *et al.* (2004b) estimated a total of 19 species once the genus is fully revised. Members of this genus are sometimes referred to as the mountain black cicadas or simply black cicadas.

Maoricicada alticola Dugdale & Fleming, 1978 E

Type photograph p. 169.

Maoricicada alticola Dugdale & Fleming, 1978: 313. Holotype male (NZAC): MB, Upper Wairau Valley, Crimea Range, Turk Ridge.

Common name: High Alpine Cicada.

Geographic distribution (Map p. 211). South Island: MB–Crimea Range, Turk Ridge (NZAC). "East of Spencer and Travers Ranges" (Dugdale & Fleming, 1978). Rainbow Ski Field (Buckley *et al*., 2002). Wairau–Rainbow [Rivers] Divide (NZAC).

Biology. High alpine (above 1800 m). Found in rock-fields on rocky ridge-crests and summits that are sparsely vegetated with small prostrate shrubs and cushion plants, e.g., *Dracophyllum, Raoulia* (J. S. Dugdale, personal communication). Seasonality: February. Xylem-feeder. Wing condition: Submacropterous.

References. Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 307 (catalogue, world). Buckley *et al*., 2002 (distribution).

Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada campbelli (Myers, 1923) E

Type photograph p. 169.

Melampsalta campbelli Myers, 1923b: 430. Holotype female (NZAC ex BMNH); WD, Otira.

Pauropsalta maorica Myers, 1923b: 431. Holotype female (NZAC ex BMNH); NN, Nelson. Synonymised by Salmon, 1950: 1.

Melampsalta maorica: Myers, 1929b: 38.

Cicadetta campbelli: Metcalf, 1963a: 299.

Maoricicada campbelli: Dugdale, 1972: 876.

Common name: Campbell's Cicada.

Geographic distribution (Map p. 211). North Island: HB, TO, WN. South Island: BR, CO, FD, KA, MB, MC, MK, NC, NN, OL, SC, SD, WD.

Biology. Lowland, subalpine. Found mostly along at least sparsely vegetated gravelly riverbeds, well-drained flats and lakeshores with rounded boulders and gravel, as well as adjacent alluvial deposits, rocks, cliff faces, grassy pastures; also on bare volcanic rock (North Island Central Volcanic Plateau); apparently absent from forests. Males usually sing on boulders or on adjacent vegetation such as grass, herbages, shrubs; emerging nymphs observed in sparsely vegetated riverflats, under boulders (possible oviposition sites for females). Seasonality: November–March, mostly January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta campbelli, M. maorica*). Hudson, 1950 (taxonomy; as *Melampsalta campbelli* and *M. maorica*). Metcalf, 1963a: 299 (catalogue, world; as *Cicadetta campbelli*). Fleming, 1971 (biology, distribution, song, taxonomy). Dugdale & Fleming, 1978 (distribution, taxonomy). Duffels & Van der Laan, 1985: 307 (catalogue, world). Buckley *et al*., 2001a (evolution), 2002 (biology). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Hill *et al*., 2009 (biogeography, evolution).

Notes.*Maoricicada campbelli* is the most widespread of *Maoricicada* species. Buckley *et al*. (2001a) conducted a phylogenetic analysis, using mtDNA sequences, which showed a relatively high level of genetic variation within *M. campbelli*, and recognised two distinct evolutionary lineages, one that arose in the North of its present range and another that arose in the South (CO-OL). The study concluded that these two lineages may prove to represent two cryptic species. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada cassiope (Hudson, 1891) E

Type photograph p. 170.

Cicada cassiope Hudson, 1891: 54. Lectotype male (designated by Fleming & Ordish, 1966; MONZ); NN, Dun Mountain.

Melampsalta cassiope: Kirby, 1896: 457.

Cicadetta cassiope: Kirkaldy, 1907b: 308.

Maoricicada cassiope: Dugdale, 1972: 876.

Common name: Screaming Cicada.

Geographic distribution (Map p. 211). North Island: RI, TO, WA. South Island: BR, KA, MB, MC, NC, NN, SD.

Biology. Montane (higher), alpine. *Dracophyllum*-dominated elevated sour-soil, granitic, dunite-dominated, subalpine pumice/ash, and greywacke, subalpine shrubland, not exceeding the shrub-line and not descending into beech forest canopy; a wary singer, favouring erect shrubs such as *Dracophyllum* (J. S. Dugdale, personal communication). Seasonality: November–May, but mostly January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta cassiope*). Hudson, 1950 (taxonomy; as *Melampsalta cassiope*). Metcalf, 1963a: 299–300 (catalogue, world; as *Cicadetta cassiope*). Fleming, 1975b (biology, distribution, song). Wise, 1977: 75 (checklist, New Zealand). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 308 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. According to Dugdale & Fleming (1978), early descriptions of this species included material of other species such as *M. mangu* and *M. oromelaena* from Mount Earnslaw, Lake Harris, Lake Wakatipu, etc., well south of the range of *M. cassiope*. These authors gave a historical review of material in the Hudson collection (MONZ) including the specimen selected as lectotype by Fleming & Ordish (1966). *Maoricicada cassiope* has been erroneously recorded as *Melampsalta nervosa* or *M. quadricincta* by early authors (e.g., Distant, 1892, 1906a; Hudson, 1893; Myers 1921a). Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada clamitans Dugdale & Fleming, 1978 E

Type photograph p. 170.

Maoricicada clamitans Dugdale & Fleming, 1978: 313. Holotype male (MONZ); MK, Mackenzie Pass.

Common name: Yodelling Cicada.

Geographic distribution (Map p. 212). South Island: CO, MK, NN, OL, SC.

Biology. Montane, subalpine. Found on low rainfall mountains on the *Aciphylla* scrub (e.g., *A. colensoi, A. aurea*) and tussock zone vegetation; occasionally found singing on

rock. Seasonality: December, January (mostly), February. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (biology, distribution; as *Maoricicada* sp. C). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 308 (catalogue, world). Simon *et al*., 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada hamiltoni (Myers, 1926) E

Type photograph p. 171.

Melampsalta hamiltoni Myers, 1926a: 71. Holotype male (NZAC ex BMNH): NC, Arthur's Pass 2500 ft [762 m].
Cicadetta hamiltoni: Metcalf, 1963a: 317.
Maoricicada hamiltoni: Dugdale, 1972: 876.

Common name: Hamilton's Cicada.

Geographic distribution (Map p. 212). North Island: RI, WA, WI, WN. South Island: BR, KA, MB, MC, MK, NC, WD.

Biology. Lowland to montane. Found in riverbeds with angular debris; nymphs feeding on riparian herbs/forbs amongst the shingle (based on where nymphal exuviae have been found) (J. S. Dugdale, personal communication). Males singing during the day, often very noisily, from bare boulders warmed up by the sun, away from vegetation, in association with females. Seasonality: November, December, January (mostly). Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta hamiltoni*). Hudson, 1950 (taxonomy; as *Melampsalta hamiltoni*). Metcalf, 1963a: 317 (catalogue, world; as *Cicadetta hamiltoni*). Fleming, 1975b (song). Wise, 1977: 75 (checklist, New Zealand). Dugdale & Fleming, 1978 (biology, distribution, taxonomy). Duffels & Van der Laan, 1985: 308 (catalogue, world). Buckley *et al*., 2002 (biology). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada iolanthe (Hudson, 1891) E

Type photograph p. 171.

Cicada iolanthe Hudson, 1891: 53. Lectotype female (designated by Fleming & Ordish, 1966; NZAC ex MONZ, Hudson Collection); WN, [Wellington] Karori.
Melampsalta iolanthe: Distant, 1892: 326.
Cicadetta iolanthe: Kirkaldy, 1909a: 27.
Maoricicada iolanthe: Dugdale, 1972: 876.

Common name: Iolanthe Cicada.

Geographic distribution (Map p. 212). North Island: BP, CL, GB, TK, TO, WN, WO.

Biology. Lowland to montane (lower). Males singing on shrubs (e.g., *Leptospermum*) and small trees out in the open or at forest margins; females nearly always encountered on bare ground, e.g., little-used pumice or clay roads; nymphal exuviae found beside such bare areas (J. S. Dugdale, personal communication). Seasonality: October–February, occasionally March. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta iolanthe*). Hudson, 1950 (taxonomy; as *Melampsalta iolanthe*). Metcalf, 1963a: 319–320 (catalogue, world; as *Cicadetta iolanthe*). Fleming, 1971 (biology, distribution, song, taxonomy), 1975b (biology). Wise, 1977: 75 (checklist, New Zealand). Dugdale & Fleming, 1978 (biology, distribution, taxonomy). Duffels & Van der Laan, 1985: 308–309 (catalogue, world). Buckley *et al*., 2002 (biology). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Myers' (1926a, 1929b) illustrations of the male genitalia of *Melampsalta iolanthe* and information on Orongorongo specimens of this species should be referred to *Maoricicada myersi*. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada lindsayi (Myers, 1923) E

Type photograph p. 172.

Pauropsalta lindsayi Myers, 1923b: 431. Holotype male (NZAC ex BMNH); NC, Mount Grey.
Melampsalta lindsayi: Myers, 1927: 688.
Cicadetta lindsayi: Fleming, 1971: 453.
Maoricicada lindsayi: Dugdale, 1972: 876.

Common name: Lindsay's Cicada.

Geographic distribution (Map p. 212). South Island: KA, MB, NC.

Biology. Lowland (mostly) to montane (lower; in eastern, low rainfall localities). Found on rock outcrops (greywacke, Tertiary limestone, siltstone) and loess (windblown silt deposits) on valley slopes, slips, and road cuttings; habitats increased by accelerated erosion of a deforested landscape (J. S. Dugdale, personal communication). Apparently absent from gravelly riverbeds and forests. Seasonality: November–January (mostly), February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta lindsayi*). Hudson, 1950 (taxonomy; as *Melampsalta lindsayi*). Metcalf, 1963a: 408 (catalogue, world; as *Pauropsalta lindsayi*). Fleming, 1971 (biology, distribution, song, taxonomy). Wise, 1977: 75 (checklist, New Zealand). Dugdale & Fleming, 1978 (taxonomy). Duffels & Van der Laan, 1985: 309 (catalogue, world). Buckley *et al*., 2002 (biology). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada mangu celer Dugdale & Fleming, 1978 [E]

Type photograph p. 172.

Maoricicada mangu celer Dugdale & Fleming, 1978: 328. Holotype male (NZAC); MB, Crimea Range, Turk Ridge.

Common name: Braying Cicada.

Geographic distribution (Map p. 212). South Island: MB–Crimea Range, Turk Ridge.

Biology. Alpine. Unlike other subspecies of *M. mangu, celer* is restricted to low rainfall alpine basins with herbfields and surrounding ridges above 1600 m (J. S. Dugdale, personal communication). Seasonality: February. Xylem-feeder. Wing condition: Submacropterous.

References. Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 309 (catalogue, world). Simon *et al.*, 2003 (distribution, song). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada mangu gourlayi Dugdale & Fleming, 1978 [E]

Type photograph p. 173.

Maoricicada mangu gourlayi Dugdale & Fleming, 1978: 328. Holotype male (MONZ); NN, Dun Mountain.

Common name: Dun Mountain Cicada.

Geographic distribution (Map p. 212). South Island: BR–Mount Robert, Matai-Roding Saddle (Dugdale & Fleming, 1978). NN–Dun Mountain (NZAC).

Biology. Montane (higher) to alpine. Found on screes and rock outcrops, especially in mineral-rich zones. Males sing on bare soil pavements (degraded soliflual debris) in degraded tussock and sparse shrubland, and on neighbouring screes and rock-fields, at subalpine to alpine levels (J. S. Dugdale, personal communication). Seasonality: December–February. Xylem-feeder. Wing condition: Submacropterous.

References. Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 309 (catalogue, world). Simon *et al.*, 2003 (distribution). Larivière, 2005 (checklist, New Zealand).

Maoricicada mangu mangu (White, 1879) [E]

Melampsalta mangu White, 1879: 214. Lectotype* female (designated by Dugdale & Fleming, 1978; BMNH ex Perth Museum, Scotland): MC, Porters Pass.

Cicadetta mangu: Kirkaldy, 1907b: 308.

Maoricicada mangu: Dugdale, 1972: 876.

Maoricicada mangu mangu: Dugdale & Fleming, 1978: 298.

Common name: Canterbury Scree Cicada.

Geographic distribution (Map p. 212). South Island: BR, MC, MK, NC, NN, SC.

Biology. Montane (higher) to alpine. Found on screes (mostly) and eroded downslope accumulations of saturated, unfrozen soil debris; sometimes collected in riverbeds, on tussock or bare rock. Males sing on bare soil pavements (degraded soliflual debris) in degraded tussock and sparse shrubland, and on neighbouring screes and rock-fields, at subalpine to alpine levels (J. S. Dugdale, personal communication); both sexes emerge at the edge of bare ground near surrounding tussock grassland where nymphs may live. Seasonality: January–March, mostly January. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta mangu*). Hudson, 1950 (taxonomy; as *Melampsalta mangu*). Metcalf, 1963a: 328–329 (catalogue, world; as *Cicadetta mangu*). Dugdale, 1972 (distribution, nomenclature; as *Maoricicada mangu*). Wise, 1977: 75 (checklist, New Zealand; as *Maoricicada mangu*). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 309–310 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. According to Dugdale & Fleming (1978), Hudson's (1950: 147) nomination of a neotype is invalid. In addition, although the type locality [for *M. mangu*] was firmly established from the start, subsequent authors applied the name widely to all subspecies and some related species. The species has also been erroneously recorded under the names *Melampsalta nervosa* or *M. quadricincta* by early authors (e.g., Distant, 1892, 1906a; Myers, 1921a). Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada mangu multicostata Dugdale & Fleming, 1978 [E]

Type photograph p. 173.

Maoricicada mangu multicostata Dugdale & Fleming, 1978: 328. Holotype male (MONZ); MB, Altimarlock [Peak] Hut.

Common name: Northern Scree Cicada.

Geographic distribution (Map p. 212). South Island: KA, MB, NC.

Biology. Subalpine to alpine. Found on bare soil faces and screes. Males sing on bare soil pavements (degraded soliflual debris) in degraded tussock and sparse shrubland, and on neighbouring screes and rock-fields, at subalpine to alpine levels (J. S. Dugdale, personal communication). Seasonality: January–March. Xylem-feeder. Wing condition: Submacropterous.

References. Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 310

(catalogue, world). Buckley *et al*., 2002 (distribution). Simon *et al.*, 2003 (distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada myersi (Fleming, 1971) E

Type photograph p. 174.

Cicadetta myersi Fleming, 1971: 455. Holotype male (MONZ); WN, Orongorongo River.

Maoricicada myersi: Dugdale, 1972: 876.

Common name: Myers' Cicada.

Geographic distribution (Map p. 212). North Island: WN–Orongorongo River and vicinity (NZAC; Dugdale, 1972).

Biology. [Lowland (including coastal), montane.] Found almost exclusively along low steeply banked streams, in angular alluvial gravel deposits, sloping accumulations of rock debris at the base of nearby cliffs or on adjacent steep rock faces where crevices containing some herbs (e.g., *Epilobium*) and grass may be used as feeding and breeding sites (suggested by the collection of nymphal exuviae); apparently absent from forests. Males sing on bare sloping accumulations of rock debris away from any vegetation. Seasonality: November–January. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1971 (biology, distribution, song, taxonomy). Wise, 1977: 75 (checklist, New Zealand). Dugdale & Fleming, 1978 (biology, distribution, taxonomy). Duffels & Van der Laan, 1985: 310 (catalogue, world). Buckley *et al*., 2002 (biology). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Notes. Additional information on distribution and biology can be found in works cited under **References**. See also **Notes** under *M. iolanthe* and **Biology** under *M. lindsayi.*

Maoricicada nigra frigida Dugdale & Fleming, 1978 E

Type photograph p. 174.

Maoricicada nigra frigida Dugdale & Fleming, 1978: 331. Holotype male (NZAC); CO, Old Man Ra. [=Range], nr. [=near] Obelisk.

Common name: Eastern Subnival Cicada.

Geographic distribution (Map p. 213). South Island: CO–Fruitlands (see above) (Dugdale & Fleming, 1978). Shingle Creek (above) (Dugdale & Fleming, 1978). Garvie Mountains (NZAC). Old Man Range, near Obelisk (NZAC). The Remarkables (NZAC) (Double Cone (Dugdale & Fleming, 1978); Lake Alta (Dugdale & Fleming, 1978), Rastus Burn (Buckley *et al*., 2002)). Pisa Range (NZAC), near Lake McKay (Dugdale & Fleming, 1978).

Biology. Alpine. Restricted to Otago lower rainfall block mountains above 1400 m (South) to 1600 m (North), where 'semi-tundra' phenomena are present, the soil is permanently moist (frozen in winter), and covered almost completely by a tight Asteraceae-dominated turf; newly emerged nymphs have been recovered from amongst roots of *Celmisia viscosa* rosettes (oviposition host?); on Garvie and Remarkables massifs, found in basins (e.g., Lake Alta) and similar seepage areas in a glaciated landscape (J. S. Dugdale, personal communication). Seasonality: January–April. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (biology, distribution; as *Maoricicada* sp. F). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 310 (catalogue, world). Buckley *et al*., 2002 (distribution). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada nigra nigra (Myers, 1921) E

Melampsalta nigra Myers, 1921a: 247. Holotype* male (presumed repository BMNH); WD, "Mountains on east side of Arthurs Pass" = Temple Basin (Dugdale & Fleming, 1978).

Cicadetta nigra: Metcalf, 1963a: 364.

Maoricicada nigra: Dugdale, 1972: 876.

Maoricicada nigra nigra: Dugdale & Fleming, 1978: 298.

Common name: Western Subnival Cicada.

Geographic distribution (Map p. 213). South Island: BR, FD, MC, MK, NC, NN, OL, WD.

Biology. Alpine. Extending into subnival (winter snow only) or approaching the nival zone (permanent snow/ice); hosts are likely to be *Dolichoglottis lyallii* and other plants dependent on snow-melt in depressions or wet screes (e.g., above Gertrude Saddle, FD, or tarn on Gloriana, Spenser Mountains, BR); males singing on ground usually close to sparse vegetation (J.S. Dugdale, personal communication). Seasonality: November–March, mostly January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta nigra*). Hudson, 1950 (taxonomy; as *Melampsalta nigra*). Metcalf, 1963a: 364 (catalogue, world; as *Cicadetta nigra*). Dugdale, 1972 (distribution, nomenclature; as *K. nigra*). Wise, 1977: 75 (checklist, New Zealand: as *M. nigra*). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 310 (catalogue, world). Simon *et al*., 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada oromelaena (Myers, 1926) [E]

Type photograph p. 175.

Melampsalta oromelaena Myers, 1926a: 65. Holotype male (NZAC); FD, Hunter Mountains, Mount Cleughearn [=Cleughearn Peak].

Cicadetta oromelaena: Metcalf, 1963a: 366.

Maoricicada oromelaena: Dugdale, 1972: 876.

Common name: Greater Alpine Black Cicada.

Geographic distribution (Map p. 213). South Island: BR, FD, MB, MC, MK, NC, NN, OL, SC, WD.

Biology. Montane (higher) to alpine. Males are heard singing from upper montane/subalpine to over 2100 m in nival zone but females are concentrated in alpine zone, herbfields, scree, and rockfalls (J. S. Dugdale, personal communication); both sexes can also be found along screes and the angular alluvial gravel deposits of streams at lower elevations. Seasonality: November–April, mostly January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta oromelaena*). Hudson, 1950 (taxonomy; as *Melampsalta oromelaena*). Metcalf, 1963a: 366 (catalogue, world; as *Cicadetta oromelaena*). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 76 (checklist, New Zealand). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 311 (catalogue, world). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada otagoensis maceweni Dugdale & Fleming, 1978 [E]

Type photograph p. 175.

Maoricicada otagoensis maceweni Dugdale & Fleming, 1978: 336. Holotype male (MONZ); SL, Takitimu Range, Cheviot Face.

Common name: Southern Speargrass Cicada.

Geographic distribution (Map p. 213). South Island: SL–Takitimu Range (NZAC) (Cheviot Face (NZAC), above Forest Service hut (Dugdale & Fleming, 1978); E [=East] of Blackmount homestead in area retired for grazing (Dugdale & Fleming, 1978); SW [=South West] ridge, Whare Creek (Dugdale & Fleming, 1978)).

Biology. Subalpine to alpine (lower). [Gullies and screes, and other habitats probably similar to those occupied by *M. otagoensis otagoensis*.] One female caught on lower leaves of large *Celmisia* (J. S. Dugdale, personal communication). Seasonality: January, February. Xylem-feeder. Wing condition: Submacropterous.

References. Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 311 (catalogue, world). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada otagoensis otagoensis Dugdale & Fleming, 1978 [E]

Type photograph p. 176.

Maoricicada otagoensis otagoensis Dugdale & Fleming, 1978: 335. Holotype male (MONZ); OL, Coronet Peak.

Common name: Otago Speargrass Cicada.

Geographic distribution (Map p. 213). South Island: CO, OL, SC.

Biology. Subalpine, alpine. Found in tussock grasslands with herbage and low shrubs, on rock outcrops (e.g., schist outcrops), screes and rocky landslides from which males sing; nymphs observed emerging from low shrubs (e.g., *Dracophyllum*). Seasonality: January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (biology, distribution; as *Maoricicada* sp. O). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 311 (catalogue, world). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Notes. The typical cicada of the speargrass belt on Central Otago mountains, marking the zone that elsewhere supports subalpine shrubland (J. S. Dugdale, personal communication), hence the common name. Additional information on distribution and biology can be found in works cited under **References**. See also **Biology** under *M. otagoensis maceweni.*

Maoricicada phaeoptera Dugdale & Fleming, 1978 [E]

Type photograph p. 176.

Maoricicada phaeoptera Dugdale & Fleming, 1978: 337. Holotype male (MONZ); OL, Sentinel Peak.

Common name: Southern Dusky Cicada.

Geographic distribution (Map p. 213). South Island: CO, MK, OL, SC.

Biology. Subalpine to alpine. Found in herb-field and adjacent *Chionochloa* grassland; males sing on bare surfaces (farm tracks, eroded soils, rocks); large numbers of emerging adults have been found in Asteraceae-dominated herbfields (January 1971 in a shallow basin on Sentinel Peak, OL) (J.S. Dugdale, personal communication). Nymphal exuviae have been found commonly around *Celmisia lyallii* (Asteraceae). Seasonality: mostly January–February. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (biology, distribution; as *Maoricicada* sp P). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 311 (catalogue, world). Simon *et al.*, 2003 (biology, distribution). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Maoricicada tenuis Dugdale & Fleming, 1978 E

Type photograph p. 177.

Maoricicada tenuis Dugdale & Fleming, 1978: 338. Holotype male (NZAC); MB, Island Pass [=Saddle].

Common name: Northern Dusky Cicada.

Geographic distribution (Map p. 213). South Island: BR, MB, NN.

Biology. Subalpine to alpine (mostly). Abundant in alpine herbfields dominated by Asteraceae and in *Chionochloa* (snowgrass) communities, in low and high rainfall areas (J. S. Dugdale, personal communication). Males sing mostly on bare soil or rock surfaces, less often on vegetation; many nymphal exuviae have been found around *Celmisia lyallii* in a herbfield under Turk Ridge (MB). Seasonality: January, February (mostly), March. Xylem-feeder. Wing condition: Submacropterous.

References. Fleming, 1975b (biology, distribution; as *Maoricicada* sp T). Dugdale & Fleming, 1978 (biology, distribution, song, taxonomy). Duffels & Van der Laan, 1985: 311 (catalogue, world). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand).

Note. Additional information on distribution and biology can be found in works cited under **References**.

Genus *Notopsalta* Dugdale, 1972 N

Notopsalta Dugdale, 1972: 864. Type species: *Cicada sericea* Walker, 1850, by original designation.

Geographic distribution. Australia (East continental), New Zealand.

References. Dugdale, 1972 (distribution, New Zealand, species list, taxonomy). Fleming, 1975a (song). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 296–297 (catalogue, world). Moulds, 1990 (Australia, biology, distribution, identification). Larivière *et al.*, 2006 (guide to New Zealand species, identification).

Notes. According to Dugdale (1972), *Notopsalta* is restricted to one New Zealand species and one Australian species (*N. atrata* Goding & Froggatt, 1904) of which he saw the type. Simon *et al.* (2003) remarked, however, that the Australian species may belong to a different genus.

Notopsalta sericea (Walker, 1850) E

Cicada sericea Walker, 1850: 169. Holotype* female (BMNH); New Zealand "a__e. New Zealand. Presented by Dr Sinclair.". Collected by Dr A. Sinclair around the Waitemata Harbour [AK] (J. S. Dugdale, personal communication).

Cicada nervosa Walker, 1850: 213. Holotype* male (BMNH); New Zealand, "a, b. New Zealand. Presented by Dr. Sinclair." Synonymised by Myers, 1926a: 62.

Melampsalta sericea: Kirby, 1896: 456.

Melampsalta cruentata var. *sericea*: Hutton, 1898b: 183.

Cicadetta sericea: Kirkaldy, 1909a: 28.

Melampsalta indistincta Myers, 1921a: 245. Syntypes* status uncertain (MONZ, Hudson collection); "Pipiriki, Wanganui River, Auckland (Hudson); Paekakariki" (Myers, 1921a: 245). Synonymised by Myers, 1926a: 62. See also **Notes**.

Melampsalta sericea: Myers, 1926a: 62.

Notopsalta sericea: Dugdale, 1972: 864.

Common name: Clay Bank Cicada.

Geographic distribution (Map p. 213). North Island: AK, BP, CL, HB, ND, RI, TK, WA, WI, WN. Offshore Islands: TH.

Biology. Lowland, mostly coastal. Collected mainly on cliffs, clay banks, dunes, and roadsides; on bare ground surfaces, trees, scrub vegetation, grass, the walls of buildings; also shelterbelts (e.g., *Casuarina*) around orchards (e.g., kiwifruit). Seasonality: October–March, mostly November–February. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta sericea*). Hudson, 1950 (taxonomy; as *Melampsalta sericea*). Metcalf, 1963a: 378–380 (catalogue, world; as *Cicadetta sericea*). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 72–73 (checklist, New Zealand). Simon *et al.*, 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Logan & Connolly, 2005 (biology, nymphal exuviae).

Notes. This taxon has been erroneously recorded by some earlier authors under the specific epithet *scutellaris* Walker. MONZ has Hudson specimens of *Melampsalta indistincta* collected from Pipiriki in 1902; they may be part of the type series. Andrews (1986) provides information on A. Sinclair's insect collecting in New Zealand, which may be useful to clarify type data.

Genus *Rhodopsalta* Dugdale, 1972 E

Rhodopsalta Dugdale, 1972: 863. Type species: *Tettigonia cruentata* Fabricius, 1775, by original designation.

Common name: Redtailed Cicadas.

Geographic distribution. New Zealand.

References. Dugdale, 1972 (distribution, species list, tax-

onomy). Fleming, 1975a (song). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 297–298 (catalogue, world). Larivière *et al*., 2006 (guide to species, identification).

Notes. Three species are known. Arensburger *et al.* (2004b) suggested the existence of an additional, undescribed species. The genus has never been revised taxonomically.

Rhodopsalta cruentata (Fabricius, 1775) [E]

Tettigonia cruentata Fabricius, 1775: 680. Syntypes 2 (Banks collection, BMNH); New Zealand (as "Habitat in nova Zelandia."). See also **Notes**.
Cicada cruentata: Goeze, 1778: 149.
Tettigonia cruentata: Fabricius, 1781: 320.
Cicada cincta Walker, 1850: 204. Holotype* apparently male (BMNH); New Zealand, "a. New Zealand. Presented by Dr. Sinclair." Synonymised by Hudson, 1950: 135.
Melampsalta cruentata: White, 1879: 214.
Cicada muta var. *minor* Hudson, 1891: 52. Lectotype* male (designated by Fleming & Ordish, 1966; AMNZ); WN, Cape Terawhiti. Synonymised with *Cicada cincta* by Distant, 1906a: 173.
Melampsalta muta var. *cruentata*: Kirby, 1896: 455.
Cicadetta cruentata: Alfken, 1904: 582.
Rhodopsalta cruentata: Dugdale, 1972: 863.

Common name: Blood Redtail Cicada.

Geographic distribution (Map p. 213). North Island: AK, BP, CL, ND, RI, TK, TO, WI, WN. South Island: KA, MB, NC, NN, WD.

Biology. [Lowland (mostly) to subalpine.] Found at low elevation on various indigenous and introduced trees and shrubs (e.g., *Alnus glutinosa*, kiwifruit, *Trifolium-Discaria toumatou* associations, *Leptospermum scoparium*, mixed grass and *Ulex europaeus*), also on *Carex*, on coastal dune grass, in beech forests, or on shrubs in subalpine environments (e.g., North Island Central Volcanic Plateau). Nymphal exuviae and oviposition scars associated with shrubs and small trees in a Nelson (NN) garden (J. S. Dugdale, personal communication). Seasonality: November, December–March (mostly), April. Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1929b (taxonomy; as *Melampsalta cruentata*). Hudson, 1950 (taxonomy; as *Melampsalta cruentata*). Metcalf, 1963a: 306–309 (catalogue, world; as *Cicadetta cruentata*). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 297–298 (catalogue, world). Simon *et al*., 2003 (biology, distribution, song). Larivière, 2005 (checklist, New Zealand). Logan & Connolly, 2005 (biology, nymphal exuviae).

Notes. Two syntypes are held in the Banks collection (BMNH); two bear hand written New Zealand labels; one has a type label; all three labels have apparently been added more recently (M. D. Webb, personal communication). The type may be one of the original insect specimens collected on Cook's first voyage and described by Fabricius (see Andrews, 1986: 39, 40) and could be from Ship Cove (or surrounding shrubby ridges or islands), D'Urville Island, or any of Cook's landing places along the east coast of the North Island between 8 October 1769 and 30 March 1770 (Andrews, 1986: 10–15) (J. S. Dugdale, personal communication). Andrews (1986) also provides information on A. Sinclair's insect collecting in New Zealand, which may be useful to clarify type data for *Cicada cincta*. Hutton's (1898a) record for the Chatham Islands is an error (Wise, 1977).

Rhodopsalta leptomera (Myers, 1921) [E]

Melampsalta leptomera Myers, 1921a: 246. Syntypes* [apparently more than 1 specimen including at least 1 female] (MONZ, Hudson collection); WN, [Wellington] Lyall Bay. See also **Note**.
Cicadetta leptomera: Metcalf, 1963a: 325.
Rhodopsalta leptomera: Dugdale, 1972: 863.

Common name: Sand Dune Redtail Cicada.

Geographic distribution (Map p. 214). North Island: AK–Warkworth (near) (Simon *et al*., 2003). Whangaparaoa Peninsula (Simon *et al*., 2003). ND–Ureti Beach (Simon *et al*., 2003). WI–Tangimoana (NZAC). Castlecliff (NZAC). WN–Lyall Bay (NZAC). Otaki Beach (NZAC). Paraparaumu Beach (NZAC). Waikanae Beach (Buckley *et al*., 2002; Arens-burger *et al.*, 2004b). Wellington (NZAC).

Biology. Lowland, coastal. Found near the beach, on sand dune vegetation, e.g., marram grass, native grass, and *Scirpus frondosus* [=*Desmoschoenus spiralis*] (low down in leaf axils). Seasonality: November–February (adults). Xylem-feeder. Wing condition: Submacropterous.

References. Myers, 1921a (biology). Myers, 1929b (taxonomy; as *Melampsalta leptomera*). Hudson, 1950 (taxonomy; as *Melampsalta leptomera*). Metcalf, 1963a: 325–326 (catalogue, world; as *Cicadetta leptomera*). Dugdale, 1972 (distribution, nomenclature). Wise, 1977: 72 (checklist, New Zealand). Duffels & Van der Laan, 1985: 298 (catalogue, world). Buckley *et al*., 2002 (distribution). Simon *et al.*, 2003 (biology, distribution). Arensburger *et al*., 2004b (distribution). Larivière, 2005 (checklist, New Zealand).

Note. MONZ has Hudson specimens of *Melampsalta leptomera* from Lyall Bay dated January 1902 with the word 'Myers' next to them; they may be part of the type series.

Rhodopsalta microdora (Hudson, 1936) E

Type photograph p. 177.

Melampsalta microdora Hudson, 1936: 230. Lectotype female (designated by Fleming & Ordish, 1966; MONZ, Hudson Collection); HB, Cape Kidnappers.

Cicadetta microdora: Metcalf, 1963a: 331.

Melampsalta microdora: Fleming & Ordish, 1966: 198.

Cicadetta microdora: Wise, 1977: 76.

Rhodopsalta microdora: Author of combination undetermined. See **Notes**.

Common name: Little Redtail Cicada.

Geographic distribution (Map p. 214). North Island: BP, GB, HB, TO (eastern). South Island: CO, DN, MC, MK, NC, OL, SC, SL (possibly inland).

Biology. Mostly unknown. Associated with shrub communities (J. S. Dugdale, personal communication). Xylem-feeder. Wing condition: Submacropterous.

References. Hudson, 1950 (taxonomy; as *Melampsalta microdora*). Metcalf, 1963a: 331 (catalogue, world; as *Cicadetta microdora*). Wise, 1977: 76 (checklist, New Zealand; as *Cicadetta microdora*). Duffels & Van der Laan, 1985: 269 (catalogue, world; as *Cicadetta microdora*). Simon *et al.,* 2003 (distribution). Larivière, 2005 (checklist, New Zealand).

Notes. This species was not listed in *Rhodopsalta* by Dugdale (1972), which may suggest he regarded it as a synonym. Wise (1977), however, listed this species in the genus *Cicadetta*. Palma *et al*. (1989) again suggested that this taxon is conspecific with *R. cruentata*. Examination of the external morphology of a rather long series of specimens from Cape Kidnappers, identified as *R. cruentata* by Fleming in MONZ, also suggests that this may be the case but it would be premature to establish this synonymy without conducting a thorough revision of the genus as it may harbour species as yet undescribed. Geographic distribution based on authors' interpretation of data from Simon *et al.* (2003) for the North Island, "central eastern regions", and the South Island, "widely distributed east of the 'main divide' from the Wairau valley south."

Superfamily MEMBRACOIDEA

Family CICADELLIDAE

Leafhoppers

References. Naudé, 1926 (revision, South Africa). Osborn, 1934a (revision, Samoa), 1934b (Marquesas Islands, revision). Oman, 1943b (genera, Nearctic Region, revision). Metcalf, 1946a (Guam, revision). Zimmerman, 1948 (Hawaii, revision). Linnavuori, 1960a (Fiji, revision), 1960b (Micronesia, revision). Metcalf, 1962–1968 (bibliography, catalogue, world). Whitten, 1965 (Australia, chromosomes). Evans, 1966 (Australia, New Zealand, taxonomy). Whitten & Taylor, 1969 (Australia, chromosomes). Knight, 1973–1976 (New Zealand, revision). Evans, 1974 (New Caledonia, revision). Eyles & Linnavuori, 1974 (Cook Islands, Niue Island, taxonomy). Linnavuori, 1975 (Micronesia, revision). Evans, 1977 (Australia, New Zealand, taxonomy). Wise, 1977 (checklist, New Zealand). Fletcher & Stevens, 1988 (Australia, identification, subfamilies, tribes). Oman et al., 1990 (bibliography, checklist, genera, world). Fletcher et al., 1991b (Australia, overview; Cicadelloidea). Day & Fletcher, 1994 (Australia, catalogue). Dietrich, 2000 (guide, subfamilies, world). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2002b (Australia, checklist; updated by Fletcher, 2006). Larivière & Fletcher, 2004 (checklist, identification, New Zealand). Dietrich, 2005 (keys to subfamilies and tribes). Larivière, 2005 (checklist, New Zealand). Dietrich, 2006 (bibliography, identification).

Subfamily DELTOCEPHALINAE

References. Linnavuori, 1959 (Neotropical Region, revision). Evans, 1966 (Australia, New Zealand, taxonomy). Knight, 1975 (New Zealand, revision). Fletcher & Condello, 1993 (BPBM types). Fletcher, 1999 (Australia, overview).

Tribe ATHYSANINI

Genus *Arahura* Knight, 1975 E

Arahura Knight, 1975: 185. Type species: *Arahura reticulata* Knight, 1975, by original designation.

Geographic distribution. New Zealand.

References. Knight, 1975 (revision). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand). Oman *et al*., 1990: 191 (bibliography, checklist, genera, world).

Arahura dentata Knight, 1975 E

Type photograph p. 152.

Arahura dentata Knight, 1975: 189. Holotype male (AMNZ); CL, Cuvier Island, summit.

Geographic distribution (Map p. 201). North Island: CL–Cuvier Island (AMNZ). Offshore Islands: TH (Knight, 1975).

Biology. [Lowland, coastal.] Collected on weeds and grass (Cuvier Island summit); swept over stream (Cuvier Island). Seasonality: January. [Phloem-feeder.] Wing condition: Brachypterous, with forewings reaching near midlength of abdomen and hindwings almost as long as forewings.

References. Knight, 1975 (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Arahura gourlayi Knight, 1975 E

Type photograph p. 152.

Arahura gourlayi Knight, 1975: 188. Holotype male (NZAC); SD, Stephens Island.

Geographic distribution (Map p. 201). South Island: SD–Stephens Island.

Biology. [Lowland.] Habitat: Unknown. Seasonality: January. [Phloem-feeder.] Wing condition: Micropterous, with forewings reaching near midlength of abdomen and hindwings reduced to small pads.

References. Knight, 1975 (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Arahura reticulata Knight, 1975 E

Type photograph p. 152.

Arahura reticulata Knight, 1975: 186. Holotype male (NZAC); FD, Hunter Mountains, Mount Burns.

Geographic distribution (Map p. 201). South Island: FD–Hunter Mountains, Mount Burns (NZAC). MC–Craigieburn, Nervous Knob (NZAC). OL–Coronet Peak (NZAC).

Biology. [Subalpine.] Collected on tussock (adults, nymphs), its probable hostplant. Seasonality: January–February. [Phloem-feeder.] Wing condition: Brachypterous to submacropterous.

References. Knight, 1975 (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Genus *Arawa* Knight, 1975 N

Arawa Knight, 1975: 176. Type species: *Arawa variegata* Knight, 1975, by original designation.

Geographic distribution. Australia (continental, Tasmania), New Zealand.

References. Knight, 1975 (New Zealand, revision). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand). Oman *et al*., 1990: 191 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1205 (Australia, catalogue). Fletcher, 2004 (Australia, checklist, distribution, New Zealand, nomenclature).

Notes. Fletcher (2004) added two species to this genus by making two new combinations. The genus *Arawa* currently contains eight species, three of which are endemic to New Zealand, three are endemic to Australia, and the remaining two are shared between the two countries. Fletcher (2004) noted, however, that a comprehensive revision of the genus, based on male genitalia, is needed and that at least five undescribed species are known in the Australian fauna.

Arawa dugdalei Knight, 1975 E

Type photograph p. 153.

Arawa dugdalei Knight, 1975: 181. Holotype male (NZAC); MB, Altimarlock [Peak].

Geographic distribution (Map p. 202). South Island: MB–Altimarlock [Peak] (NZAC). NN–Beebys Knob (NZAC).

Biology. [Subalpine, alpine.] Collected on *Agrostis tenuis* in eroded tussock area (NN). Seasonality: February. [Phloem-feeder.] Wing condition: Submacropterous.

References. Knight, 1975 (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Arawa negata (White, 1879) E new combination

Athysanus negatus White, 1879: 215. Lectotype male, here designated (Perth Museum and Art Gallery, Scotland); New Zealand.

Paradorydium negatus: Kirkaldy, 1909a: 28.

Athysanus negatus (?): Myers, 1922a: 10.

Athysanus negatus: Evans, 1966: 254.

Arawa salubris Knight, 1975: 180. Holotype male (NZAC): MK, Tasman Valley, West of Lake Pukaki. **new synonym**.

Geographic distribution (Map p. 202). North Island: TO–Ohakune (Knight, 1975). South Island: CO, DN, FD, KA, MB, MC, MK, NC, OL, SL, WD. Stewart Island.

Biology. Montane, subalpine. Collected mostly on rough stalked grass, sedges, various low plants (including *Raoulia*), and shrubs, in open or semi-open habitats, often near waterways (lagoons, lakes, streams); occasionally on *Hieracium praealtum* (adults, nymphs); also on fern in bush, *Medicago sativa*, *Nothofagus*, and in young pasture

and *Brassica rapa*. Seasonality: November, January–February (mostly), March–April. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Evans, 1966 (taxonomy; as *Athysanus negatus*). Metcalf, 1967a: 369 (catalogue, world; as *Athysanus negatus*). Knight, 1975 (biology, distribution, taxonomy; as *Arawa salubris*). Evans, 1977 (checklist; as *Arawa salubris*). Wise, 1977: 79 (checklist, New Zealand; as *Arawa salubris*), 80 (checklist, New Zealand; as *Athysanus negatus*). Syrett & Smith, 1998 (biology; as *Arawa salubris*).

Notes. The status of *Athysanus negatus* White, 1879, known only from its original description, has been ambiguous until now. The species was listed by Myers (1922a), who questioned the identity of New Zealand specimens. Evans (1966: 254) listed the species as *incertae sedis* at the end of Deltocephalinae, and suggested that it may be a synonym of *Scaphetus brunneus* Evans, but this could not be confirmed without reference to the type, the location of which was unknown at the time. Knight (1975) made no reference to *A. negatus* in his revision of New Zealand Deltocephalinae, but Wise (1977) listed the species in his checklist. A survey of the New Zealand collections did not turn up any specimen of *Athysanus* Burmeister and the genus is not believed to occur in this country. Recently, three specimens fitting White's original description – one labeled 'lectotype' and two labeled 'paralectotype' – were located in the Perth Museum, Scotland. It appears that the lectotype designation has not in fact been published and this designation is validated here to ensure the correct recognition of the species. Examination of the external morphology of the Perth Museum specimens, including the configuration of the genitalia of the male lectotype, and comparison with the holotype of *Arawa salubris* Knight, 1975, revealed the two species to be the same. Consequently, they are synonymised here and White's species is recombined within the genus *Arawa*.

Arawa novella (Metcalf, 1967) N

Deltocephalus montanus Evans, 1938: 16. Holotype* male (SAMA); South Australia, Mount Lofty. Preoccupied.
Deltocephalus novellus Metcalf, 1967b: 1167. Replacement name for *Deltocephalus montanus* Evans.
Arawa novella: Knight, 1975: 183.

Geographic distribution (Map p. 202). North Island: AK, CL, GB, HB, TO. South Island: NN–Dun Mountain (Knight, 1975). [WD]–"West coast" (Knight, 1975). Stewart Island (Knight, 1975). Offshore Islands: CH (Knight, 1976b). Extralimital range: Australia (continental, Tasmania).

Biology. Lowland, montane. Collected on *Phormium* (CH); on grasses, *Medicago sativa*, and in pasture (elsewhere). Seasonality: November–April, August. Phloem-feeder. Wing condition: Submacropterous to macropterous.

References. Metcalf, 1967b: 1167 (catalogue, world; as *Deltocephalus novellus*). Knight, 1975 (biology, distribution, taxonomy), 1976b (biology, distribution). Wise, 1977: 79 (checklist, New Zealand). Day & Fletcher, 1994: 1205 (Australia, catalogue).

Notes. *Deltocephalus montanus* was erroneously synonymised with *Deltocephalus taedius* (Kirkaldy, 1906) by Evans (1966). *Deltocephalus taedius*, currently recorded as *nomen dubium* for Australia (Day & Fletcher, 1994), belongs in *Arawa* and could be synonymous with *A. pulchra* Knight, 1975, which occurs both in Australia and New Zealand, as discussed by Knight (1975) and Fletcher & Condello (1993). See also **Notes** under *A. pulchra.*

Arawa pulchra Knight, 1975 N

Type photograph p. 153.
Arawa pulchra Knight, 1975: 185. Holotype male (NZAC ex BMNH); TO, Ohakune.

Geographic distribution (Map p. 202). North Island: TO–Ohakune. Extralimital range: Australia (continental).

Biology. [Montane.] Collected on grass. Seasonality: January. Phloem-feeder. Wing condition: Macropterous.

References. Knight, 1975 (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand). Day & Fletcher, 1994: 1206 (Australia, catalogue).

Notes. Knight (1975), Fletcher & Condello (1993), and Day & Fletcher (1994) suspected *A. pulchra* to be conspecific with *A. taedia* (Kirkaldy), currently recorded as *nomen dubium* for Australia (Queensland), but in the absence of males of Kirkaldy's species they were not able to confirm this. In New Zealand, *A. pulchra* is only known from the male holotype. See also **Notes** under *A. novella*.

Arawa variegata Knight, 1975 E

Type photograph p. 153.
Arawa variegata Knight, 1975: 178. Holotype male (NZAC); MB, Richmond Range, Fell Peak.

Geographic distribution (Map p. 202). North Island: AK, BP, GB, ND, TO, WA, WN, WO. South Island: BR, FD, MB, NN. Offshore Islands: TH.

Biology. Lowland to subalpine. Collected on *Chionochloa australis*, *Medicago sativa*, grass and in pasture. Seasonality: November–June, mostly January–February. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Knight, 1975 (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Notes. *Arawa variegata* was first recorded for New Zealand by Evans (1966) under the name *Deltocephalus taedius* (Kirkaldy, 1906), but it seems unlikely that it is the same as Kirkaldy's species, as discussed by Knight (1975). See also **Notes** under *A. novella* and *A. pulchra*.

Genus *Athysanus* Burmeister, 1838

(See Genus *Arawa* Knight, 1975)

Notes. *Athysanus negatus* White, 1879, listed by previous authors, is now placed in the genus *Arawa* Knight, 1975. *Athysanus* is not believed to occur in New Zealand.

Genus *Exitianus* Ball, 1929 N

Exitianus Ball, 1929: 5. Type species: *Cicadula exitiosa* Uhler, 1880, by original designation.

Mimodrylix Zachvatkin, 1935: 108. Type species: *Athysanus capicola* Stål, 1855, by original designation. Synonymised by Oman, 1936: 382.

Geographic distribution. Worldwide.

References. Evans, 1966 (Australia, New Zealand, taxonomy), 1977 (notes). Metcalf, 1967a: 308–335 (catalogue, world). Ross, 1968 (Palaearctic, revision). Knight, 1976b (New Zealand, Southwest Pacific, taxonomy). Wise, 1977: 80 (checklist, New Zealand). Oman *et al*., 1990: 213 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1206–1207 (Australia, catalogue).

Exitianus plebeius (Kirkaldy, 1906) N

Nephotettix plebeius Kirkaldy, 1906: 331. Lectotype male (designated by Fletcher & Condello, 1993; BPBM); [Australia] Queensland, Cairns.

Exitianus plebeius: Metcalf, 1967a: 331.

Eutettix norrisi Evans, 1938: 14. Holotype* male (SAMA); Western Australia, Crawley. Synonymised by Ross, 1968: 15.

Euscelis transversus Metcalf, 1946a: 122. Holotype* female (BPBM); Guam, Piti. Synonymised by Ross, 1968: 15.

Geographic distribution (Map p. 203). Offshore Islands: KE–Raoul Island (NZAC). Extralimital range: Australia (continental, Norfolk Island), Guam, Papua New Guinea, Samoa.

Biology. [Lowland.] Collected on *Trifolium*, *Cynodon*, and *Kyllingia*; *Scaevola gracilis*; *Stenotaphrum glabrum* (in numbers); *Imperata*, *Pteridium*, *Solanum*, and *Sporobolus*; *Ageratum conyzoides*. Seasonality: September–November, January, May, June. Phloem-feeder (graminivore). Wing condition: Macropterous.

References. Evans, 1966 (Australia, New Zealand, taxonomy). Metcalf, 1967a: 331 (catalogue, world; as *Exitianus plebeius*). Eyles & Linnavuori, 1974 (biology, distribution, South Pacific, taxonomy). Knight, 1976b (biology, distribution, taxonomy). Evans, 1977 (notes). Wise, 1977: 80 (checklist, New Zealand). Day & Fletcher, 1994: 1207 (Australia, catalogue).

Notes. This species is widespread throughout the South Pacific. It is listed by Evans (1966) under the name *Exitianus capicola* (Stål), which was subsequently considered a *nomen dubium* by Ross (1968), who regarded *E. plebeius* Kirkaldy to be the correct name (Day & Fletcher, 1994).

Genus Limotettix Sahlberg, 1871 N

Limotettix Sahlberg, 1871: 224. Type species: *Cicada striola* Fallén, 1806, designated by Van Duzee, 1892: 306.

Drylix Edwards, 1922: 206. Type species: *Cicada striola* Fallén, 1806, designated by Ball, 1929: 6 (hence *Drylix* is an objective synonym of *Limotettix*). Synonymised by Lindberg, 1924: 44.

Geographic distribution. Australian Region (continental Australia, New Zealand), Nearctic Region, Palaearctic Region.

References. Evans, 1966 (Australia, New Zealand, taxonomy). Metcalf, 1967a: 128–160 (catalogue, world). Knight, 1975 (New Zealand, revision). Oman *et al*., 1990: 225 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1208 (Australia, catalogue). Fletcher, 2000 (Australia, taxonomy).

Limotettix awae (Myers, 1924) E

Type photograph p. 154.

Cicadula awae Myers, 1924a: 182. Lectotype male (designated by Knight, 1975; NZAC ex BMNH); AK, Auckland.

Limotettix awae: Knight, 1975: 171.

Geographic distribution (Map p. 204). North Island: AK, GB, ND, WN. South Island: BR, CO, FD, MC, MK, NN, OL, SL, WD. Offshore Islands: CH.

Biology. Lowland to subalpine. Collected in open and semi-open swampy habitats, often bordering lagoons, lakes and streams; mostly on grass (including tussock) and sedges, also in mixed pastures and on various low plants (e.g., small-leaved *Coprosma*). Seasonality: December–April. [Phloem-feeder.] Wing condition: Submacropterous to macropterous (mainly the latter).

References. Metcalf, 1967b: 1960 (catalogue, world; as *Cicadula awae*). Knight, 1975 (biology, distribution, taxonomy), 1976b (distribution). Evans, 1977 (notes). Wise, 1977: 79 (checklist, New Zealand).

Limotettix harrisi Knight, 1975 E

Type photograph p. 154.

Limotettix harrisi Knight, 1975: 175. Holotype male (NZAC ex BMNH); TO, Ohakune.

Geographic distribution (Map p. 204). North Island: TO–Ohakune.

Biology. [Montane.] Habitat and seasonality: Unknown. [Phloem-feeder.] Wing condition: Macropterous.

References. Knight, 1975 (distribution, taxonomy; wing condition, genus *Limotettix*). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Limotettix pallidus Knight, 1975 E

Type photograph p. 154.

Limotettix pallidus Knight, 1975: 173. Holotype male (NZAC); MK, Tasman Valley, North of Lake Pukaki.

Geographic distribution (Map p. 204). South Island: MK–Mount Cook National Park, Mount Sebastopol, Red Lakes [=Tarns] (Knight, 1975); Tasman Valley (Knight, 1975), Acland Lagoon (Knight, 1975); Tasman Valley, North of Lake Pukaki (NZAC).

Biology. Montane, subalpine. Collected mostly on grass and sedges, in open and semi-open, often humid habitats; also on subalpine tussock grass and shrubs. Seasonality: February. [Phloem-feeder] Wing condition: Macropterous.

References. Evans, 1966 (Australia, New Zealand, taxonomy). Knight, 1975 (biology, distribution, taxonomy; wing condition, genus *Limotettix*). Evans, 1977 (checklist). Wise, 1977: 79 (checklist, New Zealand).

Limotettix pullatus (Evans, 1942) N

Deltocephalus pullatus Evans, 1942a: 148. Holotype female (BMNH); Western Australia, Yanchep.

Limottetix condylus Knight, 1975. Holotype male (QM); ND, Spirits Bay. Synonymised by Day & Fletcher, 1994: 1208.

Limottetix pullatus: Day & Fletcher, 1994: 1208.

Geographic distribution (Map p. 204). North Island: ND–Spirits Bay (Knight, 1975; as *L. condylus*). Te Paki (Knight, 1975; as *L. condylus*). Extralimital range: Australia (continental, Tasmania).

Biology. [Lowland, coastal.] Collected on sedges among *Leptospermum* and on *Leptospermum* itself. Seasonality: January. Phloem-feeder. Wing condition: Macropterous.

References. Evans, 1966 (taxonomy; as *Deltocephalus pullatus*). Metcalf, 1967b: 1184 (catalogue, world; as *Deltocephalus pullatus*). Knight, 1975 (biology, distribution, taxonomy; as *L. condylus*; wing condition, genus *Limotettix*). Evans, 1977 (checklist; as *Limotettix condylus*). Wise, 1977: 79 (checklist, New Zealand; as *L. condylus*). Day & Fletcher, 1994: 1208 (Australia, catalogue).

Genus *Scaphetus* Evans, 1966 E

Scaphetus Evans, 1966: 237. Type species: *Scaphetus brunneus* Evans, 1966, by original designation.

Geographic distribution. New Zealand.

References. Knight, 1975 (revision). Wise, 1977: 80 (checklist, New Zealand). Oman *et al*., 1990: 249 (bibliography, checklist, genera, world).

Scaphetus brunneus Evans, 1966 E

Type photograph p. 163.

Scaphetus brunneus Evans, 1966: 237. Lectotype male (designated by Knight, 1975; MONZ); ND, Bay of Islands, Paihia.

Geographic distribution (Map p. 209). North Island: AK, BP, CL, HB, ND, RI, TK, TO, WN, WO. South Island: BR, DN, MB, NN, OL, SD, SL, WD. Stewart Island.

Biology. Lowland, montane. Collected in and around forests (e.g., *Beilschmiedia tarairi*, podocarps, *Nothofagus*), including forest remnants and regenerating forests, and shrublands; on *Blechnum*, *Dryopteris* [= *Pneumatopteris*] *pennigera*, *Hebe–Uncinia* associations, *Kunzea ericoides*, *Metrosideros perforata*, and on general forest undergrowth; also from moss and leaf litter (in winter). Seasonality: Throughout the year, mostly January–March. [Phloem-feeder.] Wing condition: Submacropterous, nearly macropterous.

References. Knight, 1975 (biology, distribution, taxonomy). Wise, 1977: 80 (checklist, New Zealand).

Scaphetus simus Knight, 1975 E

Type photograph p. 163.

Scaphetus simus Knight, 1975: 196. Holotype male (NZAC); NN, Nelson.

Geographic distribution (Map p. 209). North Island: WN (Knight, 1975). South Island: BR, CO, KA, MC, MK, NN, SL. Stewart Island.

Biology. Lowland, montane. Collected on *Coprosma repens, Nothofagus* (including *N. fusca* var. *colensoi, N. fusca, N. solandri*), and undetermined low shrubs; also on coastal scrub vegetation. Seasonality: September–June. [Phloem-feeder.] Wing condition: Submacropterous, nearly macropterous.

References. Knight, 1975 (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 80 (checklist, New Zealand).

Note. Knight (1975) recorded this species from "Puhi Puhi Res.", Auckland Region (northern North Island), which probably should have been cited as Puhi Puhi Reserve, Kaikoura Region (KA), in the northeast of the South Island.

Tribe DELTOCEPHALINI

Reference. Webb & Viraktamath, 2009 (checklist, revision, world).

Genus *Horouta* Knight, 1975 N

Horouta Knight, 1975: 205. Type species: *Horouta inconstans* Knight, 1975, by original designation.

Geographic distribution. Australia (continental, Tasmania), New Zealand.

References. Knight, 1975 (New Zealand, revision). Evans, 1977 (checklist). Wise, 1977: 80 (checklist, New Zealand). Oman *et al.*, 1990: 218 (bibliography, checklist, genera, world). Fletcher, 2004 (Australia, New Zealand, revision).

Note. This genus was recently revised by Fletcher (2004), who listed six other species occurring in Australia.

Horouta inconstans Knight, 1975 E

Type photograph p. 154.

Horouta inconstans Knight, 1975: 206. Holotype male (NZAC); MK, Mount Cook National Park, Hooker Valley, 3.2 km North of Hermitage.

Geographic distribution (Map p. 203). South Island: BR, CO, DN, FD, MB, MC, MK, NC, NN, OL, SC, SL.

Biology. Lowland to subalpine. Collected mostly on grass, including *Agrostis tenuis*, tussock (adults, nymphs), low plants and shrubs, in open or semi-open (e.g., edge of *Nothofagus* forest, eroded tussock area), sometimes marshy habitats (including salt marshes); also on young pastures and *Brassica rapa*; once taken on arid hillside vegetation. Seasonality: November–April. [Phloem-feeder.] Wing condition: Macropterous or brachypterous (the latter form occurs mostly in females found at higher altitude).

References. Knight, 1975 (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 80 (checklist, New Zealand). Fletcher, 2004 (biology, distribution, taxonomy).

Genus *Maiestas* Distant, 1917 N

Maiestas Distant, 1917: 312. Type species: *Maiestas illustris* Distant, 1917, by monotypy.

Togacephalus Matsumura, 1940: 38. Type species: *Deltocephalus distinctus* Motschulsky, 1859, by original designation. Synonymised by Webb & Viraktamath, 2009: 14. Treated as a subgenus of *Recilia* by Lee, 1979: 409, Kwon & Lee, 1979: 74 and Day & Fletcher, 1994: 1203, and synonymised with *Recilia* by Dash & Viraktamath, 1998: 4.

Inazuma Ishihara, 1953: 15. Type species: *Deltocephalus dorsalis* Motschulsky, 1859, by original designation. Synonymised by Webb & Viraktamath, 2009: 14. Synonymised with *Recilia* by Nielson, 1968: 315 and Dash & Viraktamath, 1998: 4; treated as a subgenus of *Recilia* by Lee, 1979: 405 and Kwon & Lee, 1979: 80 and Day & Fletcher, 1994: 1204.

Inemadara Ishihara, 1953: 15. Type species: *Deltocephalus oryzae* Matsumura, 1902, by original designation. Synonymised by Webb & Viraktamath, 2009: 14. Synonymised with *Recilia* by Nast, 1972: 343 and Dash & Viraktamath, 1998: 5 and with *Recilia* (*Togacephalus*) by Kwon & Lee, 1979: 74.

Insulanus Linnavuori, 1960a: 303 (as subgenus of *Deltocephalus*). Type species: *Stirellus subviridis* Metcalf, 1946a, by original designation. Synonymised by Webb & Viraktamath, 2009: 14. Synonymised with *Recilia* by both Knight, 1975: 203 and Linnavuori, 1975: 617. Treated as a subgenus of *Recilia* by Day & Fletcher, 1994: 1203.

Geographic distribution. Ethiopian Region, Palaearctic Region, Oriental Region, Australian Region; Pacific Islands.

References. Metcalf, 1967a: 2175 (catalogue, world). Oman *et al.*, 1990: 227 (bibliography, checklist, genera, world). Webb & Viraktamath, 2009 (checklist, revision, world).

Note. New Zealand species listed by previous authors under *Recilia* were transferred to the genus *Maiestas* Distant, 1917, by Webb & Viraktamath (2009).

Maiestas knighti Webb & Viraktamath, 2009 N

Maiestas knighti Webb & Viraktamath, 2009: 43. Holotype male* (BMNH): MK, Tasman Valley, Glentamner Stn [Glentanner Station]

Deltocephalus hospes Kirkaldy, 1904: 177. New Zealand, misidentification (Knight, 1975: 202).

Deltocephalus (*Insulanus*) *hospes* (Kirkaldy): Fiji, misidentification (Linnavuori, 1960a: 45.)

Deltocephalus coronifer Marshall, *sensu* Evans, 1966: 240: Australia, misidentification.

Deltocephalus (*Recilia*) *hospes* Kirkaldy: New Zealand, erroneous recording (Wise, 1977: 80).

Recilia hospes (Kirkaldy): Australia, misidentification (Fletcher & Condello, 1993: 43-44).

Recilia (*Recilia*) *hospes* (Kirkaldy): Australia, erroneous recording (Day & Fletcher, 1994: 1202).

Geographic distribution (Map p. 204). North Island: AK, ND, TO, WI, WN. South Island: CO, FD, MC, MK, OL, WD. Offshore Islands: CH, TH. Extralimital range: Australia (continental), Fiji, Guam, Papua New Guinea.

Biology. Lowland, montane. Collected on grass, sedges, low plants, and shrubs; seashore and dune vegetation. Seasonality: November–April. Phloem-feeder. Wing condition: Macropterous.

References. Metcalf, 1967a: 110 (catalogue, world; as *Stirellus hospes*). Knight, 1975 (biology, distribution, taxonomy; as *Deltocephalus* (*Recilia*) *hospes*). Wise, 1977: 80 (checklist, New Zealand; as *Deltocephalus* (*Recilia*) *hospes*). Day & Fletcher, 1994: 1202–1203 (Australia, catalogue; as *Recilia* (*Recilia*) *hospes*). Webb & Viraktamath, 2009 (checklist, taxonomy).

Notes. *Maiestas knighti* was described and illustrated by Evans (1966) from Australia as *Deltocephalus coronifer* Marshall, 1866, by Knight (1975) from New Zealand as *Deltocephalus hospes* Kirkaldy and by Linnavuori (1960a) from Fiji as *Deltocephalus* (*Insulanus*) *hospes* Kirkaldy. Subsequent studies of *hospes* from its type locality (Hawaii) by Knight and of the lectotype by Webb & Viraktamath (2009) led to the conclusion that *Maiestas hospes* is so far known only from Hawaii and that material from other Pacific localities refers to this new species.

Maiestas samuelsoni (Knight, 1976)[N]

Type photograph p. 155.

Deltocephalus samuelsoni Knight, 1976b: 96. Holotype male (NZAC); KE, Raoul Island, North Terrace.

Maiestas samuelsoni: Webb & Viraktamath, 2009: 19.

Geographic distribution (Map p. 204). Offshore Islands: KE–Meyer Island (Knight, 1976b). Raoul Island (NZAC). Extralimital range: Australia (Norfolk Island only), Fiji, New Caledonia, Phillipines.

Biology. [Lowland.] Collected on *Ageratum conyzoides, Cynodon*, *Kyllingia, Trifolium*; also on grass in general, and in leaf litter. Seasonality: September–October, January, April–May. [Phloem-feeder.] Wing condition: Macropterous.

References. Knight, 1976b (biology, distribution, taxonomy; as *Deltocephalus samuelsoni*). Wise, 1977: 80 (checklist, New Zealand; as *Deltocephalus* (*Recilia*) *samuelsoni*). Webb & Viraktamath, 2009 (checklist, taxonomy).

Notes. Knight (1976b) stated that this species is closely related to *hospes*. Webb & Viraktamath (2009) noted that *samuelsoni* differs from *hospes* only in its narrower subgenital plate.

Maiestas vetus (Knight, 1975) [N]

Type photograph p. 155.

Deltocephalus (*Recilia*) *vetus* Knight, 1975: 203. Holotype male (NZAC); MK, Mount Cook National Park, Tasman Valley, 6.4 km South of Ball Hut.

Recilia (*Togacephalus*) *vetus*: Day & Fletcher, 1994: 1204.

Maiestas vetus: Webb & Varaktamath, 2009: 19.

Geographic distribution (Map p. 204). North Island: AK, CL, HB, ND, TO, WN, WO. South Island: MK, NC, NN, OL, SD, WD. Offshore Islands: KE–North Meyer Island (Knight, 1976b; as *Deltocephalus vetus*). Raoul Island (Knight, 1976b; as *Deltocephalus vetus*). Extralimital range: Australia (continental).

Biology. Lowland, montane. Collected from grass, sedges, and low shrubs; also from an *Acacia* stump, *Coprosma propinqua–Leptospermum scoparium* associations, ferns, moss, *Nothofagus*, rotten *Podocarpus*, *Pennisetum, Cortaderia*, rushes; leaf litter (KE). Seasonality: November–July, mostly February–March. Phloem-feeder. Wing condition: Macropterous.

References. Knight, 1975 (biology, distribution, taxonomy; as *Deltocephalus* (*Recilia*) *vetus*). Evans, 1977 (checklist; as *Deltocephalus* (*Recilia*) *vetus*). Wise, 1977: 80 (checklist, New Zealand; as *Deltocephalus* (*Recilia*) *vetus*). Day & Fletcher, 1994: 1204 (Australia, catalogue; as *Recilia* (*Togacephalus*) *vetus*). Webb & Varaktamath, 2009 (checklist, taxonomy).

Genus *Recilia* Edwards, 1922

(See Genus *Maiestas* Distant, 1917)

References. Metcalf, 1967a: 934–942 (catalogue, world; as *Recilia*). Knight, 1975 (New Zealand, revision; as *Deltocephalus* (*Recilia*)). Wise, 1977: 80 (checklist, New Zealand; as *Deltocephalus* (*Recilia*)). Oman *et al*., 1990: 247 (bibliography, checklist, genera, world; as *Recilia*). Day & Fletcher, 1994: 1202 (Australia, catalogue; as *Recilia*). Webb & Viraktamath, 2009 (checklist, revision, world).

Notes. Day & Fletcher (1994) gave an historical overview of the nomenclatural status of *Recilia* and its various subgeneric arrangements. New Zealand species listed by previous authors under *Recilia* were transferred to the genus *Maiestas* Distant, 1917, by Webb & Viraktamath (2009) together with most world species previously placed in *Recilia* (*Togacephalus*) Matsumura, 1940

Tribe MACROSTELINI

Reference. Knight & Webb, 1993 (biology, phylogeny, virus vector).

Genus *Balclutha* Kirkaldy, 1900[A?]

Synonymy (see Knight, 1987; Day & Fletcher, 1994).

Geographic distribution. Worldwide.

References. Davidson & DeLong, 1935 (Nearctic, revision). Evans, 1966 (Australia, key, New Zealand, taxonomy). Blocker, 1967 (taxonomy, Western Hemisphere). Metcalf, 1967c: 2382–2441 (catalogue, world). Knight, 1976b (Kermadec Islands, taxonomy). Wise, 1977: 80 (checklist, New Zealand). Knight, 1987 (South Pacific revision, world checklist). Oman *et al*., 1990: 193–194 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1217–1219 (Australia, catalogue).

Notes. Prior to 1987, *Balclutha viridinervis* Matsumura, 1914, was the only *Balclutha* species recorded from New Zealand (Kermadec Islands only). Knight (1976b), how-

ever, indicated the presence on the Kermadec Islands of a second species "similar to [*B.*] *filum* Linnavuori [=*B. lucida* (Butler)]." Knight (1987) listed *B. incisa* (Matsumura, 1902), *B. lucida* (Butler, 1877) and *B. rieki* Knight, 1987, as new records for New Zealand, with *B. incisa* and *B. lucida* specimens reported to be deposited in the DSIR [=NZAC] collection. Although the material examined by Knight has not been found, a single male specimen of *B. incisa* has been located in unsorted NZAC material and confirms this species in the North Island. The presence of *B. lucida* – a senior synonym of *B. filum* – on the Kermadec Islands has also been confirmed through identification of previously undetermined NZAC material. The New Zealand record of *B. rieki* is based on a single collecting event made, according to Knight (1987), in 1985 in the Auckland region, that included three males and three females. These specimens, which could not be located either, were included by Knight (1987) in his series of *B. rieki* paratypes that also includes several specimens from many other Australasian countries and territories. The present authors do not consider *B. rieki* to have established itself in the North Island of New Zealand. This leaves New Zealand with three species of *Balclutha*, *B. incisa* in the North Island and *B. viridinervis* and *B. lucida*, both occurring on the Kermadec Islands, not on New Zealand's main islands. See also **Appendix D**.

Balclutha incisa (Matsumura, 1902) [A]

Synonymy (see Metcalf, 1967c; Knight, 1987; Day & Fletcher, 1994).

Geographic distribution (Map p. 202). AK–Huia Dam (NZAC). Extralimital range: Cosmopolitan.

Biology. Lowland. Found on grass. Recorded (outside New Zealand) on *Acacia*, *Digitaria sanguinalis, Ehrharta longiflora* in Australia; on *Cynodon dactylon, Cyperus ferax, Daucus carota, Eriochloa subglabra, Ipomoea batatas, Oryza sativa, Panicum barbinode, Saccharum*. Seasonality: Unknown. Phloem-feeder. Wing condition: Macropterous.

References. Metcalf, 1967c: 2450 (catalogue, world as *Nesosteles incisus*). Knight, 1987 (checklist, biology, distribution, taxonomy). Day & Fletcher, 1994: 1218 (Australia, catalogue). Moir *et al.*, 2003 (Australia, distribution). Narhardiyati & Bailey, 2005 (Australia, distribution, biology).

Notes. Knight's (1987) New Zealand record of *B. incisa* was based on specimens apparently from the DSIR (=NZAC) collection. However, this material could not be located. Currently, the only evidence of this species occurring in this country is from a newly identified specimen in NZAC.

Balclutha lucida (Butler, 1877) [A?]

Synonymy (see Metcalf, 1967c; Knight, 1987; Day & Fletcher, 1994).

Geographic distribution (Map p. 202). Offshore Islands: KE–Raoul Island (NZAC). Extralimital range: Australian Region (including Australia, New Caledonia, Papua New Guinea, Polynesia, Vanuatu), Nearctic Region, Neotropical Region, Ethiopian Region, and Oriental Region.

Biology. [Lowland.] Hostplant: *Oryza sativa*. Seasonality: Unknown. Phloem-feeder. Wing condition: Macropterous.

References. Metcalf, 1967c: 2409 (catalogue, world). Eyles & Linnavuori, 1974 (biology, distribution, South Pacific, taxonomy). Knight, 1987 (checklist, distribution, taxonomy). Wilson & Claridge, 1991 (biology). Day & Fletcher, 1994: 1218 (Australia, catalogue).

Balclutha viridinervis Matsumura, 1914 [A?]

Synonymy (see Metcalf, 1967c; Knight, 1987).

Geographic distribution (Map p. 202). Offshore Islands: KE–Raoul Island (Knight, 1976b; as *B. flexuosa*). Extralimital range: Australia (continental), India, South East Asia, Thailand, western Pacific.

Biology. [Lowland.] Collected on *Kyllingia* (in large numbers); also on *Ageratum conyzoides*, *Cynodon*, *Nicotiana tabacum, Stenotaphrum glabrum*, *Trifolium*. Hostplants: *Oryza, Cajanus*. Seasonality: September, October (mostly). Phloem-feeder. Wing condition: Macropterous.

References. Metcalf, 1967c: 2440 (catalogue, world). Knight, 1976b (biology, distribution, taxonomy; as *B. flexuosa*). Wise, 1977: 80 (checklist, New Zealand; as *B. flexuosa*). Knight, 1987 (checklist, distribution, taxonomy).

Genus *Macrosteles* Fieber, 1866 [A]

Synonymy (see Metcalf, 1967c; Oman *et al*., 1990).

Geographic distribution. Ethiopian Region, Holarctic Region; New Zealand (adventive).

References. Beirne, 1952 (Nearctic Region, revision). Metcalf, 1967c: 2486–2611 (catalogue, world). Knight, 1975 (New Zealand, taxonomy). Wise, 1977: 80 (checklist, New Zealand). Oman *et al*., 1990: 227 (bibliography, checklist, genera, world).

Note. This genus has not been recorded from Australia.

Macrosteles fieberi (Edwards, 1889) [A]

Synonymy (see Metcalf, 1967c; Knight, 1975).

Geographic distribution (Map p. 204). South Island: CO–Old Man Range, 15 km S of Alexandra (NZAC). MK–

Mount Cook National Park, Mount Sebastopol, Red Lakes [=Tarns] (Knight, 1975; BMNH); first New Zealand record, 1972 (Knight, 1975). Extralimital range: Holarctic Region.

Biology. [Montane, subalpine.] Collected on tussock grass and shrubs in marshy areas. In Europe, also occurs in marshy areas. Seasonality: February. [Phloem-feeder.] Wing condition: Macropterous.

References. Ribaut, 1952 (biology, Europe). Metcalf, 1967c: 2527–2531 (catalogue, world). Knight, 1975 (biology, distribution, taxonomy). Evans, 1977 (notes). Wise, 1977: 80 (checklist, New Zealand).

Genus *Nesoclutha* Evans, 1947 [N]

Nesoclutha Evans, 1947c: 126. Type species: *Nesoclutha obscura* Evans, 1947c, by monotypy.

Irunula Ribaut, 1948: 58. Type species: *Cicadula erythrocephala* Ferrari, 1882, by original designation. Synonymised by Vilbaste, 1976: 28.

Geographic distribution. Australian Region (continental Australia, Lord Howe Island, New Caledonia, New Zealand, Norfolk Island, Tasmania), Ethiopian Region, Palaearctic Region.

References. Evans, 1966 (Australia, key, New Zealand, taxonomy). Metcalf, 1967c: 2442 (catalogue, world). Knight, 1975 (New Zealand, taxonomy). Wise, 1977: 80 (checklist, New Zealand). Oman *et al.*, 1990 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1220 (Australia, catalogue).

Nesoclutha phryne (Kirkaldy, 1907) [N] new combination

Nesosteles phryne Kirkaldy, 1907a: 66. Lectotype male (designated by Fletcher & Condello, 1993; BPBM); Australia, New South Wales, Mittagong.

Eusceloscopus pallidus Evans, 1942a: 147. Holotype* male (BMNH); Australia, Western Australia, Yanchep. Synonymised by Fletcher & Condello, 1993, through lectotype designation of *N. phryne* (see **Notes** below).

Nesoclutha obscura Evans, 1947c: 126. Holotype* male (BMNH); Australia, Victoria, Melbourne. Synonymised by Evans, 1966: 252.

Nesoclutha pallida: Evans, 1966: 252.

Common name: Australian Grass Leafhopper.

Geographic distribution (Map p. 205). North Island: AK, BP, CL, ND, TK, WN. South Island: BR, CO, DN, MB, MC, MK, NC, NN, OL, SL. Extralimital range: Australian Region (continental Australia, Java, Lord Howe Island, New Caledonia, Norfolk Island, Tasmania).

Biology. Lowland, montane. Collected mostly on grass (including tussock), low plants and shrubs; also on bracken fern (*Pteridium esculentum*), *Nothofagus*, young pasture, legumes, and *Brassica rapa*. Seasonality: November–July. Phloem-feeder. Wing condition: Macropterous. Economic importance: In Australia, reported to be the vector of cereal chlorotic mottle rhabdovirus, chloris striate mosaic geminivirus, paspalum striate mosaic geminivirus, and the causative agent of maize wallaby ear.

References. Grylls, 1963 (economic importance). Evans, 1966 (Australia, taxonomy; as *Balclutha phryne* and *Nesoclutha pallida*). Metcalf, 1967c: 2442 (catalogue, world; as *Nesoclutha obscura*). Knight, 1975 (biology, distribution, taxonomy; as *Nesoclutha pallida*), 1976b (distribution; as *Nesoclutha pallida*). Greber, 1977 (economic importance). Evans, 1977 (notes; as *Nesoclutha pallida*). Wise, 1977: 80 (checklist, New Zealand; as *Nesoclutha pallida*). Day & Fletcher, 1994: 1220 (Australia, catalogue; as *Nesoclutha pallida*).

Notes. Day & Fletcher (1994) explained that the designation of a lectotype for *N. phryne* Kirkaldy (by Fletcher & Condello, 1993) has established this name as a senior synonym of *N. pallida*, but that the widespread use of the latter name justified application of the syntype series of the Kirkaldy material to be set aside to maintain nomenclatural stability. Day & Fletcher (1994) intended to prepare an application to the International Commission on Zoological Nomenclature along these lines, but apparently did not go ahead with this. Consequently, the correct name under the rule of priority is *N. phryne*.

Tribe OPSIINI

Genus *Orosius* Distant, 1918 [A]

Orosius Distant, 1918: 85. Type species: *Orosius albicinctus* Distant, 1918, by original designation.

Nesaloha Oman, 1943a: 33. Type species: *Nesaloha cantonis* Oman, 1943a, by original designation. Synonymised by Evans, 1947a: 236.

Geographic distribution. Australian Region (continental Australia, New Zealand, Norfolk Island, Melanesia, Papua New Guinea, Polynesia), Ethiopian Region, Oriental region, Palaearctic Region.

References. Evans, 1966 (Australia, New Zealand, taxonomy). Ghauri, 1966 (revision). Metcalf, 1967b: 1670–1672 (catalogue, world). Knight, 1976b (New Zealand, Southwest Pacific, taxonomy). Evans, 1977 (notes). Wise, 1977: 80 (checklist, New Zealand). Oman *et al*., 1990: 237 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1211 (Australia, catalogue).

Orosius argentatus (Evans, 1938) [A]

Thamnotettix argentata Evans, 1938: 15. Holotype* male (AM); Australia, Victoria, Burnley.
Orosius argentatus: Oman, 1949: 11.
Nesophrosyne argentatus: Linnavuori, 1960b: 320.
Orosius argentatus: Ghauri, 1966: 242.

Geographic distribution (Map p. 207). Offshore Islands: KE–Meyer Island (Knight, 1976b). Raoul Island (Knight, 1976b). South Meyer Island (Knight, 1976b). Extralimital range: Africa, Australia (continental, Norfolk Island), Fiji, Java, Melanesia, New Britain, Polynesia.

Biology. [Lowland.] Collected on *Ageratum*, *Carex*, and grasses (in numbers); also on leaves of agave and on sedge. Hostplants: A wide variety of plants in many families. Seasonality: October–December. [Phloem-feeder.] Wing condition: Macropterous. Economic importance: Well-known vector of plant phytoplasma diseases in Australia.

References. Evans, 1966 (Australia, New Zealand, taxonomy). Metcalf, 1967b: 1671–1672 (catalogue, world). Eyles & Linnavuori, 1974 (biology, distribution, South Pacific, taxonomy). Knight, 1976b (distribution). Wise, 1977: 80 (checklist, New Zealand). Fletcher *et al*., 1991b (economic importance). Day & Fletcher, 1994: 1211 (Australia, biology, catalogue).

Notes. Additional disease vector information can be found in Day & Fletcher (1994). Recently, use of this name in Australia has declined in favour of *Orosius orientalis* (Matsumura). This follows a synonymy between the two names proposed by Kwon & Lee (1979) based on comparison between Australian and Korean material. Subsequent workers did not follow this proposal because *O. orientalis* was described from Japan and not Korea. Specimens from Japan have now been compared with Australian material by the second author (M. Fletcher) and Kwon & Lee's (1979) proposal appeared to be valid. However, more recent molecular work comparing CO1 gene sequences from Japan and Australia (M. Fletcher, A. Mitchell & H. Löcker, unpublished data) indicates that *O. argentatus* may be a valid name for at least part of the Australian fauna. Consequently, the authors are being cautious in retaining use of this name for the New Zealand where molecular work is also needed to confirm the identity and ascertain the origin of New Zealand populations.

Subfamily EUACANTHELLINAE

Tribe EUACANTHELLINI

Genus *Euacanthella* Evans, 1938 [A]

Euacanthella Evans, 1938: 8. Type species: *Euacanthella palustris* Evans, 1938, by original designation.

Geographic distribution. Australia (continental, Tasmania); New Zealand (adventive).

References. Metcalf, 1963b: 248 (catalogue, world). Evans, 1966 (Australia, New Zealand, taxonomy). Knight, 1974b (New Zealand, taxonomy). Wise, 1977: 78 (checklist, New Zealand). Oman *et al.*, 1990: 211 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1144 (Australia, catalogue).

Euacanthella palustris Evans, 1938 [A]

Euacanthella palustris Evans, 1938: 8. Holotype* female (SAMA, collection J.W. Evans); [Australia] Tasmania, Snug.
Euacanthella insularis Evans, 1938: 9. Holotype male (SAMA); [Australia] Tasmania, Hobart. Synonymised by Evans, 1966: 143.
Euacanthella brunnea Evans, 1966: 143. Holotype* female (AMNZ); AK, Auckland, Portland Road. Synonymised by Evans, 1974: 173.

Geographic distribution (Map p. 203). North Island: AK, CL, HB, ND. South Island: NN–Maitai [River Valley], Smith's Ford (Knight, 1974b). First New Zealand record: AK, Auckland, 1956 (Evans, 1966; as *E. brunnea*). Extralimital range: Australia (New South Wales, Tasmania).

Biology. Lowland, coastal (mostly). Hostplants: A wide variety of plants in many families. Seasonality: January–May, July. Phloem-feeder. Wing condition: Brachypterous or macropterous.

References. Metcalf, 1963b: 248 (catalogue, world). Evans, 1966 (taxonomy; as *Euacanthella brunnea* and *E. palustris*). Knight, 1974b (biology, distribution, taxonomy). Wise, 1977: 78 (checklist, New Zealand). Day & Fletcher, 1994: 1144–1145 (Australia, catalogue).

Notes. This species was first described as *E. insularis* Evans, 1938, from Hobart, Tasmania, and later (Evans, 1966) under the name *brunnea*, from Auckland (Knight, 1974b). Evans (1938) described three species: *E. palustris, E. bicolor,* and *E. insularis*. In 1966 Evans synonymised *E. bicolor* and *E. insularis* under *E. palustris*, and added another species, *E. brunnea* from New Zealand. Later (Evans, 1974) he reinstated *E. bicolor* and synonymised *E. brunnea* and *E. palustris*. At the same time, Knight (1974b: 476) also synonymised *E. brunnea*, but under the name *E. insularis*. As Evans (1966) can be regarded as the first reviser and was certainly the first to propose the syn-

onymy between *E. palustris* and *E. insularis*, his use of the name *E. palustris* gives this name seniority over *E. insularis.* Day & Fletcher (1994) noted that the specimen in SAMA labelled as the holotype of *E. insularis* has label data which do not match the original published data. They recognised a different specimen from the J. W. Evans collection as the one which Evans had intended as the holotype. This specimen now bears a label identifying it as the holotype of *E. insularis*, determined by M. J. Fletcher, 1994.

Subfamily EUPELICINAE

Tribe PARADORYDIINI

References. Evans, 1937 (Australia, revision); Morrison, 1973 (Oriental Region, revision).

Genus *Paradorydium* Kirkaldy, 1901 N

Dorydium Burmeister, 1838: pls 10, 11, 17, 20. Type species: *Dorydium paradoxum* Burmeister, 1838, by original designation. Preoccupied.

Paradorydium Kirkaldy, 1901: 339. Replacement name for *Dorydium* Burmeister.

Carphosoma Royer, 1907: 29. Unnecessary replacement name for *Dorydium* Burmeister.

Deltodorydium Kirkaldy, 1907a: 73 (as subgenus of *Paradorydium*). Type species: *Paradorydium brighami* Kirkaldy, 1907a, by original designation. Synonymised by Evans, 1937: 45.

Oman *et al*. (1990) list other synonyms from outside the Australian Region.

Geographic distribution. Australian Region (continental Australia, New Zealand), Ethiopian Region, Palaearctic Region.

References. Metcalf, 1963c: 106–114 (catalogue, world). Evans, 1966 (Australia, New Zealand, taxonomy). Knight, 1973a (New Zealand, revision). Oman *et al.*, 1990: 238–239 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1221 (Australia, catalogue).

Note. This genus is in need of more extensive collecting and ecological recording and, ultimately, of taxonomic revision.

Paradorydium aculeatum Knight, 1973 E

Type photograph p. 161.

Paradorydium aculeatum Knight, 1973a: 966. Holotype male (NZAC); CO, Mount Bitterness.

Geographic distribution (Map p. 208). South Island: CO–Mount Bitterness.

Biology. [Subalpine.] Collected in leaf litter. Seasonality: January. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

References. Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Note. This taxon may be conspecific with *P. gourlayi* and/or *P. watti*.

Paradorydium cuspis Knight, 1973 E

Paradorydium cuspis Knight, 1973a: 968. Holotype* female (BMNH); NN, Mount Arthur.

Geographic distribution (Map p. 208). South Island: NN–Mount Arthur.

Biology. [Montane.] Habitat: Unknown. Seasonality: February. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

References. Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Paradorydium gourlayi Evans, 1966 E

Type photograph p. 161.

Paradorydium gourlayi Evans, 1966: 139. Holotype female (NZAC); NN, Tahuna [=Tahunanui, Nelson].

Geographic distribution (Map p. 208). South Island: NN–Nelson, Tahunanui.

Biology. [Lowland.] Habitat: Unknown. Seasonality: February. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

References. Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Evans, 1977 (notes). Wise, 1977: 78 (checklist, New Zealand).

Note. This taxon may be conspecific with *P. aculeatum* and/or *P. watti*.

Paradorydium insulare Evans, 1966 E

Type photograph p. 162.

Paradorydium insularis [*sic*] Evans, 1966: 139. Holotype male (MONZ); SD, Stephens Island.

Geographic distribution (Map p. 208). South Island: SD–Stephens Island.

Biology. [Lowland.] Habitat: Unknown. Seasonality: November, January. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

Reference. Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Wise, 1977: 78 (checklist, New Zealand; as *P. insularis* [*sic*]).

Notes. The holotype is from Stephens Island, not Stewart Island as stated by Evans (1966). This species may be synonymous with *P. sertum*. *Paradorydium* is a neuter noun, therefore requiring an adjective with a neuter ending.

Paradorydium philpotti Myers, 1923 E

Type photograph p. 162.

Paradorydium philpotti Myers, 1923a: 417. Holotype male (NZAC ex BMNH); FD, Hump Range [=Hump Ridge].

Paradorydium stewartensis Evans, 1966: 139. Holotype female (MONZ); Stewart Island, Port Pegasus. Synonymised by Knight, 1973a: 961.

Geographic distribution (Map p. 208). South Island: BR–Cape Foulwind, Okari River (Knight, 1973a). FD–Hump Ridge (NZAC). Stewart Island: Big South Cape Island (Knight, 1973a); Freshwater Creek area (Knight, 1973a); Port Pegasus (MONZ, NZAC) (Belltopper Falls, bush above (Knight, 1973a); Chase Island [=Pearl Island] (Knight, 1973a); Crooked Reach (Knight, 1973a)). Rakeahua Valley (NZAC).

Biology. [Lowland, montane.] Collected on foliage (several adults, nymphs), *Dracophyllum longifolium* (several adults); also on bracken fern (*Pteridium esculentum*) and from a swamp. Seasonality: October–January, February (mostly). [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

References. Metcalf, 1963c: 113 (catalogue, world). Evans, 1966 (taxonomy). Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Evans, 1977 (notes). Wise, 1977: 78 (checklist, New Zealand).

Note. Knight (1973a) only tentatively considered the Cape Foulwind specimen (a female) to be of this species although similar externally to specimens from Stewart Island.

Paradorydium sertum Knight, 1973 E

Type photograph p. 162.

Paradorydium sertum Knight, 1973a: 966. Holotype male (NZAC); OL, Mount Coronet [=Coronet Peak].

Geographic distribution (Map p. 208). South Island: OL–Coronet Peak.

Biology. [Subalpine.] Habitat: Unknown. Seasonality: December. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

References. Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Note. This taxon may be conspecific with *P. insulare*.

Paradorydium watti Knight, 1973 E

Type photograph p. 162.

Paradorydium watti Knight, 1973a: 967. Holotype male (NZAC); MB, Awatere Valley, Molesworth.

Geographic distribution (Map p. 208). South Island: MB–Awatere Valley, Molesworth.

Biology. [Lowland.] Collected in moss. Seasonality: March. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.

References. Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Note. This taxon may be conspecific with *P. aculeatum* and/or *P. gourlayi*.

Paradorydium westwoodi (White, 1879) E

Dorydium westwoodi White, 1879: 215. Lectotype* female (designated by Knight, 1973a; BMNH); MC, near Christchurch.

[*Paradorydium*] *westwoodi*: Kirkaldy 1909a: 28. Intended generic placement for this species.

Paradorydium westwoodi: Myers, 1923a: 416.

Notocephalius westwoodi: Evans, 1947b: 148. *Paradorydium westwoodi*: Evans, 1966: 138.

Geographic distribution (Map p. 208). South Island: MC–Banks Peninsula (Dyers Pass (NZAC); Governors Bay (Knight, 1973a); Sign of the Kiwi (NZAC)). Christchurch (Knight, 1973a), including Port Hills (NZAC).

Biology. [Lowland, montane.] Collected on *Poa caespitosa* [=*P. cita*] (adults, nymphs); on rushes; once on *Leptospermum scoparium*. Seasonality: November–December, April. [Phloem-feeder.] [Wing condition: Forewings coriaceous, submacropterous; hindwings micropterous.]

References. Evans, 1966 (taxonomy). Knight, 1973a (biology, distribution, taxonomy; wing condition, genus *Paradorydium*). Wise, 1977: 78 (checklist, New Zealand).

Subfamily IASSINAE

Tribe IASSINI

Genus *Batracomorphus* Lewis, 1834 N

Batracomorphus Lewis, 1834: 51. Type species: *Batracomorphus irroratus* Lewis, 1834, by monotypy.

Eurinoscopus Kirkaldy, 1906: 346. Type species: *Eurinoscopus lentiginosus* Kirkaldy, 1906, by original designation. Synonymised by Linnavuori, 1960b: 238.

Ossana Distant, 1914: 518. Type species: *Ossana bicolor* Distant, 1914, by original designation. Synonymised by Linnavuori & Quartau, 1975: 30.

Batrachomorphus [*sic*]: Linnavuori, 1960b: 238.

Acojassus Evans, 1972: 656. Type species: *Acojassus montanus* Evans, 1972, by original designation. Synonymised by Knight, 1983: 31.

Edijassus Evans, 1972: 656. Type species: *Edijassus pallidus* Evans, 1972, by original designation. Synonymised by Knight, 1983: 31.

Geographic distribution. Worldwide.

References. Evans, 1966 (Australia, New Zealand, taxonomy; *Batrachomorphus* [*sic*]). Metcalf, 1966a: 118–133 (catalogue, world). Knight, 1974b (New Zealand, revision). Wise, 1977: 79 (checklist, New Zealand). Knight, 1983 (Australian and Oriental Regions, revision). Oman *et al*., 1990: 194 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1185 (Australia, catalogue).

Batracomorphus adventitiosus Evans, 1966 N

Type photograph p. 153.

Batrachomorphus [*sic*] *adventitiosus* Evans, 1966: 207. Holotype male (NZAC); ND, Whangarei.

Batracomorphus adventitiosus: Knight, 1974b: 490.

Geographic distribution (Map p. 202). North Island: AK, ND, TO, WN. South Island: DN, MC, MK, SL. Offshore Islands: TH. Extralimital range: Australian Region (continental Australia, Vanuatu).

Biology. [Lowland, montane.] Collected in large numbers on *Leptocarpus* [=*Apodasmia*] *similis* (adults) and *Plagianthus divaricatus* (adults, nymphs); in lesser numbers on *Hoheria glabrata* (adults, nymphs), *Plagianthus betulinus* [=*P. regius*] (adults), *Coprosma parviflora* (adults), *C. robusta* (nymphs); also found on *Juncus* (at base), *Kunzea ericoides*, *Leptospermum scoparium*, *Muehlenbeckia, Nothofagus solandri cliffortioides*, in *Nothofagus* scrub, on *Polystichum aculeatum*, and various grasses, low plants and shrubs. [Hostplants: *Plagianthus*, *Hoheria*, *Coprosma.*] Seasonality: November–March, May. Phloem-feeder. Wing condition: Submacropterous, nearly macropterous; forewings semi-coriaceous.

References. Knight, 1974b (biology, distribution, taxonomy). Wise, 1977: 79 (checklist, New Zealand). Knight, 1983 (biology, distribution, taxonomy). Day & Fletcher, 1994: 1186 (Australia, catalogue).

Batracomorphus angustatus (Osborn, 1934) N?

Bythoscopus angustatus Osborn, 1934a: 166. Holotype* male (BMNH); Tonga, Vava'u, Neiafu.

Eurinoscopus punctatus Evans, 1940: 10. Holotype* male (QM); Australia, Queensland, Darling Downs. Synonymised by Knight, 1983: 51.

Iassus angustatus: Metcalf, 1966a: 45.

Batrachomorphus [sic] *punctatus*: Evans, 1966: 206.

Batracomorphus angustatus: Knight, 1974b: 491.

Geographic distribution (Map p. 202). North Island: AK–Te Atatu (NZAC). WN–Wellington (Knight, 1974b). South Island: CO, MB, MK, NN. Offshore Islands: KE, TH. Extralimital range: Australian Region (continental Australia, Fiji, Niue, Norfolk Island, Tonga), Oriental Region.

Biology. [Lowland, montane.] Collected on *Cassinia* [=*Ozothamnus*] (adults, nymphs), including *Cassinia leptophylla* and *C. vauvilliersii* [=*Ozothamnus leptophyllus*]; on *Cytisus*, *Erigeron*, grass (including tussock), low plants and shrubs; also on *Ageratum*, *Carex*, and grasses (KE). [Hostplant: *Ozothamnus*.] Seasonality: October (KE), November, January–February, May. [Phloem-feeder.] Wing condition: Macropterous; forewings semi-coriaceous. Economic importance: Reported to be a vector of the phytoplasma diseases tomato big bud and potato purple top wilt.

References. Evans, 1966 (taxonomy; as *Batrachomorphus* [*sic*] *punctatus*). Metcalf, 1966a: 45 (catalogue, world; as *Iassus angustatus*). Eyles & Linnavuori, 1974 (biology, distribution, South Pacific, taxonomy). Knight, 1974b (biology, distribution, taxonomy), 1976b (biology, distribution). Wise, 1977: 79 (checklist, New Zealand). Knight, 1983 (biology, distribution, taxonomy). Day & Fletcher, 1994: 1186 (Australia, catalogue, economic importance).

Notes. According to Knight (1976b), this is possibly the unnamed species referred to by Myers (1921b) as occurring both on the Kermadecs and in New Zealand. The current distribution suggests that the species may be adventive on New Zealand's main islands, possibly originating from other areas of the Southwest Pacific.

Subfamily IDIOCERINAE

Reference. Webb, 1983 (Australia, revision).

Genus *Idiocerus* Lewis, 1834 A

Synonymy (see Metcalf, 1966b; Oman *et al*., 1990).

Geographic distribution. Ethiopian Region, Holarctic Region; New Zealand (adventive).

References. Maldonado Capriles, 1964 (India, Philippines, taxonomy). Evans, 1966 (Australia, New Zealand, taxonomy). Metcalf, 1966b: 8–209 (catalogue, world). Knight, 1974b (New Zealand, taxonomy). Webb, 1976 (Ethiopian Region, taxonomy). Wise, 1977: 78 (checklist, New Zealand). Webb, 1983 (Australia, revision). Oman *et al*., 1990: 219 (bibliography, checklist, genera, world).

Note. This genus has not been recorded from Australia.

Idiocerus distinguendus Kirschbaum, 1868 A

Synonymy (see Metcalf, 1966b; Nast, 1972; Knight, 1974b).

Geographic distribution (Map p. 203). North Island: WI–Paiaka (NZAC). South Island: CO, MC, NC, OL, SC, SL, WD. First New Zealand record (Evans, 1963). Extralimital range: Palaearctic Region.

Biology. [Lowland, montane] Collected mostly on white poplar (*Populus alba*); also on *Populus nigra 'Italica'*. In France, recorded mainly on white poplar (*P. alba*), sometimes on black poplar (*P. nigra*). Seasonality: January–March. Phloem-feeder. Wing condition: Macropterous.

References. Ribaut, 1952 (biology, France). Evans, 1966 (taxonomy). Metcalf, 1966b: 42 (catalogue, world; as a synonym of *Idiocerus cognatus*). Dumbleton, 1967 (biology, distribution, identification). Knight, 1974b (biology, distribution, taxonomy). Wise, 1977: 79 (checklist, New Zealand).

Genus *Rhytidodus* Fieber, 1872 [A]

Synonymy (see Metcalf, 1966b; Oman *et al*., 1990; Day & Fletcher, 1994).

Geographic distribution. Palaearctic Region, adventive elsewhere; Australian Region (continental Australia, New Zealand), Nearctic Region.

References. Metcalf, 1966b: 209–210 (catalogue, world). Knight, 1974b (New Zealand, taxonomy; as *Idiocerus*). Wise, 1977: 78 (checklist, New Zealand; as *Idiocerus*). Oman *et al*., 1990: 248 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1165–1166 (Australia, catalogue).

Note. The authorship of this genus is discussed by Day & Fletcher (1994).

Rhytidodus decimaquartus (Schrank, 1776) [A]

Synonymy (see Day & Fletcher, 1994).

Geographic distribution (Map p. 208). North Island: GB, HB, WA,WO. South Island: CO, MB, MC, NN, OL, SC, SL. First New Zealand records: MC, Christchurch and MB, Hanmer, 1964 (Dumbleton, 1967; as *Idiocerus decimusquartus* [*sic*]). Extralimital range: Australia? (New South Wales but see **Notes** below), Nearctic Region, Palaearctic Region.

Biology. [Lowland.] Collected mostly on *Populus nigra* or *P. nigra 'Italica'*, sometimes also on *P. deltoides*. In France, recorded mainly on *Populus nigra*, sometimes on *Salix* or *Alnus*. In North America, recorded almost exclusively on *Populus nigra*, but sometimes *P. deltoides*. Seasonality: November–April. Phloem-feeder. Wings condition: Macropterous. Economic importance: Phytoplasma disease vector (Europe).

References. Ribaut, 1952 (biology, France). Freitag, 1965 (biology, North America). Metcalf, 1966b: 56–64 (catalogue, world; as *Idiocerus decimaquartus*). Dumbleton, 1967 (biology, distribution, identification; as *Idiocerus decimusquartus* [*sic*]). Knight, 1974b (biology, distribution, taxonomy; as *Idiocerus decimaquartus*). Wise, 1977: 78 (checklist, New Zealand; as *Idiocerus decimaquartus*). Day & Fletcher, 1994: 1166 (Australia, catalogue).

Notes. More information on hostplants and additional remarks on distribution and taxonomy are available in Day & Fletcher (1994) who also note that the record from Australia is based on a single male specimen collected near a quarantine facility. They state that the species is probably not established in Australia.

Subfamily MACROPSINAE

References. Evans, 1966 (Australia, New Zealand, revision), 1971a (Australia, New Guinea, revision). Linnavuori, 1978 (Ethiopian Region, revision). Hamilton, 1980c (taxonomy, world; Macropsini).

Genus *Zelopsis* Evans, 1966 [E]

Zelopsis Evans, 1966: 168. Type species: *Zelopsis nothofagi* Evans, 1966, by monotypy.

Geographic distribution. New Zealand.

References. Knight, 1974b (taxonomy). Wise, 1977: 78 (checklist, New Zealand). Oman *et al*., 1990: 261 (bibliography, checklist, genera, world).

Zelopsis nothofagi Evans, 1966 [E]

Type photograph p. 163.

Zelopsis nothofagi Evans, 1966: 168. Holotype female (NZAC); NN, Aniseed Valley.

Geographic distribution (Map p. 209). North Island: HB, ND–Ohuri (Knight, 1974b), RI, TK, TO, WN. South Island: BR, CO, FD, KA, MB, MC, MK, NC, NN, OL, SC, SL. Stewart Island.

Biology. Lowland to subalpine. Collected mostly on *Nothofagus solandri* (including *N. solandri cliffortioides*), but also on other *Nothofagus* species (e.g., *N. fusca*, *N. menziesii*); on low shrubs and other vegetation at the margins of *Nothofagus* forests; in leaf litter under fern in *Nothofagus* forest. [Hostplants: *Nothofagus solandri*, possibly other *Nothofagus* species.] Seasonality: November–March. [Phloem-feeder.] Wing condition: Submacropterous, nearly macropterous.

References. Knight, 1974b (biology, distribution, taxonomy). Wise, 1977: 78 (checklist, New Zealand).

Subfamily TARTESSINAE

Tribe THYMBRINI

References. Evans, 1937 (Australia, revision; as tribe of Ledrinae), 1969 (Australia, New Guinea, taxonomy; as tribe of Ledrinae). Knight, 1974a (New Zealand, revision; as tribe of Ledrinae).

Note. The tribe Thymbrini was transferred from the subfamily Ledrinae to the subfamily Tartessinae by Jones & Deitz (2009).

Genus *Novothymbris* Evans, 1941 [E]

Novothymbris Evans, 1941: 162. Type species: *Diedrocephala zealandica* Myers, 1923a, by original designation.

Geographic distribution. New Zealand.

References. Metcalf, 1962c: 124–126 (catalogue, world). Evans, 1966 (New Zealand, taxonomy). Knight, 1974a (revision). Wise, 1977: 77 (checklist, New Zealand). Oman *et al*., 1990: 235 (bibliography, checklist, genera, world).

Notes. Knight (1974a) divided the genus into species groups on the basis of the male genitalia: *zelandica*-group (*zelandica, notata, punctata, tararua*); *cithara*-group (*cithara, notialis, peregrina, vagans*); *castor*-group (*castor, pollux*); other species (*cassiniae, hinemoa, eylesi, extremitatis, maorica, solitaria*). The genus is in need of more extensive collecting and ecological recording and of further taxonomic revision.

Novothymbris cassiniae (Myers, 1923) [E]

Type photograph p. 157.

Diedrocephala cassiniae Myers, 1923a: 408. Holotype male (NZAC ex BMNH); WN, Wellington.

Tylozygus cassiniae: Myers, 1927: 689.

Novothymbris cassiniae: Evans, 1941: 163.

Geographic distribution (Map p. 205). North Island: WN–Red Rocks (Knight, 1974a). Terawhiti (NZAC). Wellington (NZAC). South Island: MB–Black Birch Range (NZAC).

Biology. [Lowland to subalpine.] Collected in numbers on *Ozothamnus leptophyllus* and *Olearia solandri*. Seasonality: October–November, January–February, April, June. [Phloem-feeder.] Wing condition: Submacropterous; forewings coriaceous.

References. Myers, 1923a (biology). Metcalf, 1962c: 124 (catalogue, world). Evans, 1966 (taxonomy). Knight, 1974a (biology, distribution, taxonomy). Wise, 1977: 77 (checklist, New Zealand).

Novothymbris castor Knight, 1974 [E]

Type photograph p. 157.

Novothymbris castor Knight, 1974a: 464. Holotype male (NZAC); DN, Lake Mahinerangi.

Geographic distribution (Map p. 206). South Island: DN, MC, MK, NC.

Biology. [Lowland to subalpine.] Collected on *Coprosma* (including *C. parviflora*), *Hebe* (including *H. salicifolia*, *H. odora*), *Hoheria glabrata*, *Brachyglottis cassinioides*, *Muehlenbeckia*, *Nothofagus*; also on shrubs at the margin of *Nothofagus* forests, and on various other shrubs and grasses (including tussock). Seasonality: November, January–February. [Phloem-feeder.] Wing condition: Submacropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon could be conspecific with *N. pollux*.

Novothymbris cithara Knight, 1974 [E]

Novothymbris cithara Knight, 1974a: 460. Holotype male (NZAC ex LUNZ); BR, Westport, Island Creek area.

Geographic distribution (Map p. 206). North Island: TO–Ohakune (Knight, 1974a). South Island: BR–Westport, Island Creek area (NZAC). NN–Takaka Hill (Knight, 1974a). Waimangaroa (Knight, 1974a).

Biology. [Lowland, montane.] Collected on *Weinmannia racemosa*. Seasonality: October–December. [Phloem-feeder.] Wing condition: Submacropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Novothymbris extremitatis Knight, 1974 [E]

Type photograph p. 158.

Novothymbris extremitatis Knight, 1974a: 470. Holotype male (NZAC); ND, Spirits Bay, Unuwhao.

Geographic distribution (Map p. 206). North Island: ND–Spirits Bay, Unuwhao.

Biology. [Lowland.] Habitat: Unknown. Seasonality: January. Wing condition: Submacropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon is closely related to *N. maorica* (Knight, 1974a).

Novothymbris eylesi Knight, 1974 [E]

Type photograph p. 158.

Novothymbris eylesi Knight, 1974a: 468. Holotype male (NZAC); KA, Seaward Kaikoura Range, Mount Snowflake.

Geographic distribution (Map p. 206). South Island: KA–Seaward Kaikoura Range, Mount Snowflake.

Biology. [Montane.] Collected on *Ozothamnus leptophyllus* (adults, nymphs), its probable hostplant. Seasonality: October. [Phloem-feeder.] Wing condition: Submacropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon is most closely related to *N. hinemoa* (Knight, 1974a).

Novothymbris hinemoa (Myers, 1923) [E]

Diedrocephala hinemoa Myers, 1923a: 412. Holotype* male (BMNH, could not be located); NN, Nelson.
Diedrocephala dunensis Myers, 1923a: 411. Holotype female (NZAC ex BMNH); NN, Dun Mountain. Synonymised by Knight, 1974a: 468.
Tylozygus dunensis: Myers, 1927: 689.
Tylozygus hinemoa: Myers, 1927: 689.
Novothymbris dunensis: Evans, 1941: 163.
Novothymbris hinemoa: Evans, 1941: 163.

Geographic distribution (Map p. 206). South Island: BR–Mount Misery (NZAC). NN–Aniseed Valley (Knight, 1974a). Dun Mountain (NZAC). Mount Arthur, tableland (Knight, 1974a). Mount Peel (Knight, 1974a). Nelson (Knight, 1974a). Takaka Hill (Knight, 1974a). Whangamoa Saddle (NZAC). SD–D'Urville Island (NZAC). Stephens Island (NZAC).

Biology. Lowland to subalpine. Collected on *Hebe stricta*, its hostplant. Seasonality: October–November, December–January (mostly), February–March. [Phloem-feeder.] Wing condition: Submacropterous; forewings coriaceous.

References. Metcalf, 1962c: 125 (catalogue, world). Knight, 1974a (biology, distribution, taxonomy). Evans, 1966 (taxonomy; as *Novothymbris dunensis* and *N. hinemoa*), 1977 (notes). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon is most closely related to *N. eylesi* (Knight, 1974a).

Novothymbris maorica (Myers, 1923) [E]

Diedrocephala maorica Myers, 1923a: 409. Holotype* male (BMNH, could not be located); WN, Wainuiomata.
Diedrocephala hudsonica Myers, 1923a: 414. Holotype female (NZAC ex BMNH); WN, Karori. Synonymised by Knight, 1974a: 470.
Tylozygus maorica: Myers, 1927: 689.
Tylozygus hudsonica: Myers, 1927: 689.
Novothymbris maorica: Evans, 1941: 163.
Novothymbris hudsonica: Evans, 1941: 163.

Geographic distribution (Map p. 206). North Island: WN–Karori (NZAC). Wainuiomata (Knight, 1974a).

Biology. [Lowland.] Habitat: Unknown. Seasonality: February. [Phloem-feeder.] Wing condition: Submacropterous, nearly macropterous; forewings coriaceous.

References. Metcalf, 1962c: 125 (catalogue, world). Knight, 1974a (biology, distribution, taxonomy). Evans, 1966 (taxonomy; as *Novothymbris hudsonica* and *N. maorica*), 1977 (notes). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon is closely related to *N. extremitatis* (Knight, 1974a).

Novothymbris notata Knight, 1974 [E]

Type photograph p. 158.
Novothymbris notata Knight, 1974a: 457. Holotype male (NZAC ex BMNH); ND, Whangarei.

Geographic distribution (Map p. 206). North Island: AK, BP, CL, ND. Offshore Islands: TH.

Biology. Lowland. Collected mostly on *Leptospermum scoparium* and *Kunzea ericoides*, both potential hostplants; also on sedges in swampy lowlands. Seasonality: November–December, January (mostly), February–April. [Phloem-feeder.] Wing condition: Macropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon could be conspecific with *N. zealandica*.

Novothymbris notialis Knight, 1974 [E]

Type photograph p. 159.
Novothymbris notialis Knight, 1974a: 463. Holotype male (NZAC); Stewart Island, Mount Rakeahua.

Geographic distribution (Map p. 206). South Island: FD, SL. Stewart Island.

Biology. [Lowland to subalpine.] Collected on *Coprosma* (several adults and nymphs); *Cassinia* [=*Ozothamnus*?] and *Dracophyllum* among tussock (one adult, several nymphs); also on *Olearia virgata.* [Hostplant: *Coprosma.*] Seasonality: December–February. [Phloem-feeder.] Wing condition: Submacropterous, nearly brachypterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon is closely related to *N. vagans* (Knight, 1974a).

Novothymbris peregrina Knight, 1974 [E]

Type photograph p. 159.
Novothymbris peregrina Knight, 1974a: 462. Holotype male (NZAC); FD, Eglinton Valley.

Geographic distribution (Map p. 206). South Island: BR–Lake Rotoroa (Knight, 1974a). FD–Eglinton Valley (NZAC).

Biology. [Lowland.] Habitat: Unknown. Seasonality: January–February. [Phloem-feeder.] Wing condition: Submacropterous, nearly brachypterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon could be conspecific with *N. vagans*.

Novothymbris pollux Knight, 1974 E

Type photograph p. 159.

Novothymbris pollux Knight, 1974a: 466. Holotype male (NZAC); MC, [Christchurch] McLennans Bush.

Geographic distribution (Map p. 207). South Island: MC–McLennans Bush.

Biology. Altitudinal range and habitat: Unknown. Seasonality: December. [Phloem-feeder.] Wing condition: Submacropterous, nearly brachypterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 77 (checklist, New Zealand).

Note. This taxon could be conspecific with *N. castor*.

Novothymbris punctata Knight, 1974 E

Type photograph p. 159.

Novothymbris punctata Knight, 1974a: 458. Holotype male (NZAC); WN, Wellington.

Geographic distribution (Map p. 207). North Island: WN–Wellington (NZAC). York Bay (Knight, 1974a).

Biology. [Lowland.] Habitat: Unknown. Seasonality: November–January. [Phloem-feeder.] Wing condition: Submacropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Novothymbris solitaria Knight, 1974 E

Type photograph p. 160.

Novothymbris solitaria Knight, 1974a: 471. Holotype male (NZAC); CH, Chatham Island, Awatotara, forest [=Awatotara Forest].

Geographic distribution (Map p. 207). Offshore Islands: CH, Chatham Island, Awatotara Forest.

Biology. Lowland. Collected on *Olearia* (adults, nymphs), *Dracophyllum* and *Cyathodes* [=*Leucopogon* or *Leptecophylla*] in bog, in forest leaf litter, and in swamp forest. [Hostplant: *Olearia*.] Seasonality: January–March. [Phloem-feeder.] Wing condition: Macropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Knight, 1976b (biology, distribution). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Novothymbris tararua (Myers, 1923) E

Type photograph p. 160.

Diedrocephala tararua Myers, 1923a: 410. Holotype female (NZAC ex BMNH); WN, Tararua Range, Mount Alpha.

Tylozygus tararua: Myers, 1927: 689.

Novothymbris tararua: Evans, 1941: 163.

Novothymbris tararuia [*sic*]: Evans, 1966: 131.

Geographic distribution (Map p. 207). North Island: WN–Tararua Range (Mount Alpha (NZAC); Bull Mound (Knight, 1974a)). South Island: SD–Stephens Island (NZAC).

Biology. [Lowland, montane.] Habitat: Unknown. Seasonality: January–February. [Phloem- feeder.] Wing condition: Macropterous; forewings coriaceous.

References. Metcalf, 1962c: 125 (catalogue, world). Knight, 1974a (biology, distribution, taxonomy). Evans, 1966 (taxonomy; as *Novothymbris tararuia* [*sic*]), 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Novothymbris vagans Knight, 1974 E

Type photograph p. 160.

Novothymbris vagans Knight, 1974a: 462. Holotype male (NZAC); FD, Hunter Mountains, Monowai, road to Mount Burns.

Geographic distribution (Map p. 207). South Island: BR–Arorangi Reserve, Greymouth (Knight, 1974a). Mount Misery (NZAC). FD–Clinton River (NZAC). Hunter Mountains, Monowai, road to Mount Burns (NZAC). Simonin Creek, Upper Pyke River (NZAC). Turret Range, Wolfe Flat (NZAC). Wilmot Pass (NZAC).

Biology. [Lowland to subalpine.] Collected on *Coprosma* (adults, nymphs), *Nothofagus* (adults, nymphs), and *Hebe* (adults). Seasonality: December–February. [Phloem-feeder.] Wing condition: Macropterous; forewings coriaceous.

References. Knight, 1974a (biology, distribution, taxonomy). Evans, 1977 (checklist). Wise, 1977: 78 (checklist, New Zealand).

Notes. This taxon is closely related to *N. notialis* (Knight, 1974a). It could be conspecific with *N. peregrina*.

Novothymbris zealandica (Myers, 1923) E

Type photograph p. 160.

Diedrocephala zealandica Myers, 1923a: 409. Holotype male (NZAC ex BMNH); NN, Dun Mountain.

Tylozygus zealandica: Myers, 1927: 689.

Novothymbris zealandica: Evans, 1941: 163.

Geographic distribution (Map p. 207). North Island: AK, CL, ND, TK, TO, WN. South Island: BR, FD, NC, NN, OL, WD. Stewart Island.

Biology. [Lowland, montane.] Collected on *Coprosma-Melicytus* association, *Corokia*, *Kunzea ericoides*, *Nothofagus menziesii*, *Olearia lacunosa*, *Podocarpus*, dead *Rhopalostylis sapida* trunk; also in *Agathis australis* forest gully. Seasonality: October–April. [Phloem-feeder.] Wing condition: Macropterous; forewings coriaceous.

References. Metcalf, 1962c: 126 (catalogue, world). Evans, 1966 (taxonomy). Knight, 1974a (biology, distribution, taxonomy). Wise, 1977: 78 (checklist, New Zealand).

Note. This taxon could be conspecific with *N. notata*.

Subfamily TYPHLOCYBINAE

References. Matsumura, 1931 (genera, Oriental Region, Palaearctic Region, revision). Young, 1952 (classification, Western Hemisphere). Dlabola, 1958 (classification, Palaearctic Region). Dumbleton, 1964 (distribution, identification, New Zealand). Evans, 1966 (Australia, New Zealand, taxonomy). Mahmood, 1967 (genera, Oriental Region, revision). Sohi & Dworakowska, 1984 (India, revision). Fletcher & Donaldson, 1992 (Australia, biology, taxonomy). Dietrich & Dmitriev, 2006 (Erythroneurini, genera, New World, review).

Tribe EMPOASCINI

Genus *Kybos* Fieber, 1866 [A]

Synonymy (see Metcalf, 1968; Oman *et al*., 1990).

Geographic distribution. Holarctic Region; Australian Region (Australia - New South Wales), New Zealand; adventive).

References. DeLong, 1931 (Nearctic, revision; as *Empoasca* (*Kybos*)). Lower, 1952 (Australia, revision; as genus). Metcalf, 1968: 364–425 (catalogue, world; as *Empoasca* (*Kybos*)). Dworakowska, 1976 (taxonomy; as *Empoasca* (*Kybos*)). Wise, 1977: 81 (checklist, New Zealand; as genus). Oman *et al*., 1990: 209 (bibliography, checklist, genera, world; as *Empoasca* (*Kybos*)). Mühlethaler *et al*., 2009 (Central Europe, revision; as genus).

Note. This taxon was first recorded in Australia by Fletcher & Knight (1998).

Kybos lindbergi (Linnavuori, 1951) [A]

Synonymy (see Nast, 1972).

Geographic distribution (Map p. 203). South Island: MC–Ashburton (NZAC). Christchurch (Dean's Avenue Nursery; Riccarton) (Knight, 1976a; as *Kybos betulicola*). First New Zealand record: Riccarton, MC, 1961 (Dumbleton, 1964; misidentified as *Kybos betulicola* (Wagner, 1955)). Extralimital range: Australia (New South Wales), Palaearctic Region.

Biology. Lowland. Collected on *Betula alba*, *Betula* sp. (Knight, 1976a; as *Kybos betulicola*). Hostplant: *Betula*. Seasonality: December–January. Parenchyma-feeder. Wing condition: Macropterous.

References. Metcalf, 1968: 334 (catalogue, world; as *Empoasca* (*E.*) *lindbergi*). Knight, 1976a (biology, distribution, taxonomy; as *Kybos betulicola*). Wise, 1977: 81 (checklist, New Zealand; as *Kybos betulicola*). Fletcher & Knight, 1998 (Australia, biology; as *Empoasca* (*Kybos*) *lindbergi*). Mühlethaler *et al.*, 2009 (Central Europe, taxonomy).

Note. Most specimens listed by Knight (1976b) as having been deposited in the DSIR [=NZAC] collection, could not be located.

Kybos smaragdula (Fallén, 1806) [A]

Synonymy (see Metcalf, 1968; Knight, 1976a).

Geographic distribution (Map p. 203). South Island: MC–Christchurch (NZAC), Botanical Gardens (Knight, 1976a). First New Zealand record: MC, Christchurch, 1964 (NZAC; Dumbleton, 1964). Extralimital range: Nearctic Region, Palaearctic Region.

Biology. Lowland. Collected on *Alnus* (adults, one nymph). Seasonality: December–January. [Parenchyma-feeder.] Wing condition: Macropterous.

References. Evans, 1966 (Australia, New Zealand, taxonomy; as *Empoasca* (*Kybos*) *smaragdula*). Metcalf, 1968: 403–418 (catalogue, world; as *Empoasca* (*Kybos*) *smaragdula*). Knight, 1976a (biology, distribution, taxonomy; as *Empoasca* (*Kybos*) *smaragdula*). Wise, 1977: 81 (checklist, New Zealand; as *Empoasca* (*Kybos*) *smaragdula*). Mühlethaler *et al.*, 2009 (Central Europe, taxonomy).

Genus *Matatua* Knight, 1976 [E]

Matatua Knight, 1976a: 85. Type species: *Matatua montivaga* Knight, 1976a, by original designation.

Geographic distribution. New Zealand.

References. Knight, 1976a (revision). Wise, 1977: 81–82 (checklist, New Zealand). Oman *et al*., 1990: 228 (bibliography, checklist, genera, world).

Matatua maorica (Myers, 1923) [E]

Type photograph p. 155.

Dikraneura maorica Myers, 1923a: 423. Lectotype female (designated by Knight, 1976a; NZAC ex BMNH); WI [Wanganui], Longacre.

Matatua maorica: Knight, 1976a: 86.

Geographic distribution (Map p. 204). North Island: WI–Longacre.

Biology. [Lowland.] Habitat: Unknown. Seasonality: December. [Parenchyma-feeder.] Wing condition: Macropterous.

References. Metcalf, 1968: 147 (catalogue, world; as *Dikraneura maorica*). Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 82 (checklist, New Zealand).

Note. This taxon could be conspecific with *M. montivaga*.

Matatua montivaga Knight, 1976 [E]

Type photograph p. 155.

Matatua montivaga Knight, 1976a: 85. Holotype male (NZAC); MK, Mount Cook National Park, Mount Sebastopol, Red Lakes [=Tarns].

Geographic distribution (Map p. 205). South Island: MK–Mount Cook National Park (Governors Bush (Knight, 1976a); Hooker Valley, 1.6 and 3.2 km N of Hermitage (Knight, 1976a); Mount Sebastopol, Red Lakes [=Tarns] (NZAC); 0.8 km S of Kea Point (Knight, 1976a)). OL–Mount Aspiring National Park, Makarora (NZAC).

Biology. Montane. Collected in large numbers on *Coprosma parviflora* and *Polystichum vestitum*; also collected on grass, low plants and shrubs; low shrubs at margin of *Nothofagus* forest; *Nothofagus-Podocarpus* association; shrubs and tussock grass; understorey vegetation in *Nothofagus* forest. [Hostplant: *Coprosma parviflora*.] Seasonality: January–February (mostly). [Parenchyma-feeder.] Wing condition: Macropterous.

References. Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 82 (checklist, New Zealand).

Notes. Knight (1976a) remarked that "females of the genus, possibly belonging to this species, have been examined from Spirit's Bay and Te Paki [ND], Wainuiomata in Wellington [WN], the West Arm of L. [=Lake] Manapouri [FD] in Otago Province, and Nelson [NN]." See also **Note** under *M. maorica.*

Tribe ERYTHRONEURINI

Genus *Anzygina* Fletcher & Larivière, 2009 [N]

Anzygina Fletcher & Larivière, 2009: 165. Type species: *Erythroneura sidnica* Kirkaldy, 1906, by original designation.

Geographic distribution. New Zealand, Australia (continental, Tasmania), Lord Howe Island, Norfolk Island, Papua New Guinea.

Reference. Fletcher & Larivière, 2009 (taxonomy, key to species).

Anzygina agni (Knight, 1976) [A]

Type photograph p. 151.

Zygina agni Knight, 1976a: 77. Holotype male (NZAC, missing except for male genitalia); AK, Auckland, Greenlane.
Anzygina agni: Fletcher & Larivière, 2009: 168.

Geographic distribution (Map p. 201). North Island: AK–Auckland, Greenlane. Extralimital range: Australia (New South Wales, South Australia).

Biology. [Lowland.] Collected on *Geranium* (Australia). Seasonality: November (Australia), January (AK). [Parenchyma-feeder.] Wing condition: Macropterous.

References. Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 81 (checklist, New Zealand). Fletcher & Larivière, 2009 (taxonomy, genitalia figures).

Notes. Knight (1976a) suggested that the species was endemic to New Zealand but Fletcher & Larivière (2009) proposed that the species was adventive in New Zealand. Its biostatus in Australia is also unclear as it has only been collected from exotic *Geranium*.

Anzygina barrattae Fletcher & Larivière, 2009 [E]

Type photograph p. 151.

Anzygina barrattae Fletcher & Larivière, 2009: 174. Holotype male (NZAC), SL, Ajax Swamp.

Geographic distribution (Map p. 201). South Island: SL–Ajax Swamp.

Biology. [Lowland.] Hostplants: unknown. Seasonality: January–February. [Parenchyma-feeder]. Wing condition: Macropterous.

Reference. Fletcher & Larivière, 2009: (taxonomy, genitalia figures).

Note. This species forms an endemic species group with *A. ramsayi* and *A. toetoe*.

Anzygina dumbletoni (Ghauri, 1963) [A?]

Zygina dumbletoni Ghauri, 1963: 39. Holotype male (BMNH); MC, [Christchurch] Riccarton.
Anzygina dumbletoni: Fletcher & Larivière, 2009: 170.

Common name: Dumbleton's Leafhopper.

Geographic distribution (Map p. 201). North Island: AK–Auckland (Henderson; Mount Albert) (NZAC). CL–Coroglen (NZAC). GB–Wairoa. (Knight, 1976a). HB–Hastings (Dumbleton, 1964). South Island: MC–Christchurch, Riccarton (Knight, 1976a). Selwyn River (Knight, 1976a). Springston (Knight, 1976a). NN–Nelson (NZAC; Knight, 1976a), Botanical Hill (Knight, 1976a).

Biology. [Lowland.] Collected on *Acaena novae-zelandiae* (NN), blackberry (*Rubus fruticosus* (AK, CL, HB, MC), *Dactylis glomerata* (NN), raspberry (*Rubus idaeus*) (AK, MC); bred on blackberry (MC). Described from raspberry and blackberry growing at Riccarton [MC]; Dumbleton (1964) recorded it again from raspberry at Riccarton, from strawberry (*Fragaria* x *ananassa*) at Hastings and blackberry at Springston. Seasonality: November, January, March–May, August. [Parenchyma-feeder.] Wing condition: Macropterous. Economic importance: Has been found on cane fruit and strawberries.

References. Dumbleton, 1964 (biology, distribution). Evans, 1966 (key, taxonomy). Knight, 1976a (biology, distribution, key, taxonomy). Wise, 1977: 81 (checklist, New Zealand). Fletcher & Larivière, 2009 (taxonomy, genitalia figures). Charles, 2004 (economic importance).

Notes. The specimens supporting the locality records given by Knight (1976a), and listed as having been deposited in the DSIR [=NZAC] collection, could not be located. The earliest NZAC record at hand is of a collection from Nelson in 1944. Dumbleton (1964) stated that the species was

introduced to New Zealand based on its association with deciduous food plants, its winter diapause and the form of the aedeagus. Knight (1976a) suggested that it was endemic. Fletcher & Larivière (2009) supported the extralimital origin of the species but, as with Dumbleton (1964), reported no records from outside New Zealand. Knight (1976a) illustrated what he believed to be an aberrant form of this species from New Zealand but did not list collection details of any material. Additional material of this form from several localities in Queensland indicated that the form was a separate Australian species and was described as *Anzygina billi* by Fletcher & Larivière (2009). No specimens of *A. billi* are currently known from New Zealand.

Anzygina ramsayi (Knight, 1976) [E]

Type photograph p. 151.

Zygina ramsayi Knight, 1976a: 75. Holotype male (NZAC); RI, Ruahine Range.

Anzygina ramsayi: Fletcher & Larivière, 2009: 173.

Geographic distribution (Map p. 201). North Island: RI–Ruahine Range (NZAC). South Island: BR–Lewis Pass (NZAC).

Biology. [Lowland, montane.] Collected on *Dracophyllum* (RI). Seasonality: January–February. [Parenchyma-feeder.] Wing condition: Macropterous.

References. Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 81 (checklist, New Zealand). Fletcher & Larivière, 2009 (taxonomy, genitalia figures).

Notes. The type locality indicated on the holotype label is Ruahine Range, Hawkes Bay. This suggests that the type series was collected on the eastern side, the Hawkes Bay side, of the Ruahines and consequently in the Rangitikei (RI) area code for the purpose of this catalogue. *Anzygina ramsayi* is here recorded from the South Island for the first time, but it is likely that this is in fact a South Island species which extends its range North across the Cook Strait in the greater Wellington-Wairarapa-Hawkes Bay region of the southern North Island. Such a distribution pattern in not uncommon among New Zealand insects. The distribution of *A. ramsayi* also suggests that the species is more widely distributed on both the North and South Island than is currently recognised; more collecting and a better understanding of habitat preferences is needed in order to verify this. As noted by Fletcher & Larivière (2009) this species with *A. toetoe* and *A. barrattae* are endemics with similar aedeagal structure and may represent a separate endemic genus.

Anzygina toetoe (Cumber, 1952) [E]

Type photograph p. 151.

Erythroneura toetoe Cumber, 1952a: 525. Holotype male (MONZ); WI, Paiaka.

Zygina toetoe: Knight, 1976a: 75.

Anzygina toetoe: Fletcher & Larivière, 2009: 174.

Geographic distribution (Map p. 201). North Island: BP–Rotorua, Mamaku Plateau (27 km West) (NZAC). RI–Ruahine Range, Triplex Creek (NZAC). WI–Paiaka (MONZ).

Biology. [Lowland.] Collected on toetoe (*Cortaderia fulvida*) in swamp area (adults, nymphs), its hostplant; also on undergrowth vegetation, e.g., *Blechnum*, in *Nothofagus* forest. Seasonality: October–February. [Parenchyma-feeder.] Wing condition: Macropterous.

References. Metcalf, 1968: 1105–1106 (catalogue, world; as *Erythroneura toetoe*). Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 81 (checklist, New Zealand).

Notes. This species is unusual in that the tegmen is obliquely truncate apically, whereas all other species have the tegmen apically rounded. Its association with native species of *Cortaderia* was reported by Fletcher & Larivière (2009). This species forms an endemic species group with *A. ramsayi* and *A. barrattae*.

Anzygina zealandica (Myers, 1923) [N]

Type photograph p. 152.

Erythroneura zealandica Myers, 1923a: 424. Holotype male (NZAC ex BMNH); Wellington [=WN], Tararua Range.

Erythroneura kiekie Myers, 1923a: 426. Holotype male (BMNH); [WN] York Bay. Synonymised by Knight, 1976a: 73.

Erythroneura cyathea Myers, 1923a: 426. Lectotype male (designated by Knight, 1976a; NZAC ex BMNH); [WN] York Bay. Synonymised by Knight, 1976a: 73.

Erythroneura ansonae Myers, 1923a: 427. Holotype female (BMNH); [WN] Wellington, Karori. Synonymised by Knight, 1976a: 73.

Erythroneura ix Myers, 1928a: 312. Holotype male (BMNH); Australia, Victoria, Melbourne. Synonymised by Knight, 1976a: 73.

Zygina zealandica: Knight, 1976a: 73.

Anzygina zealandica: Fletcher & Larivière, 2009: 173.

Common name: Grass Leafhopper.

Geographic distribution (Map p. 201). North Island: AK, BP, CL, GB, HB, ND, RI, TO, WA, WI, WN, WO. South Island: BR, CO, FD, KA, MC, MK, NN, OL, SC, SD, SL, WD. Offshore Islands: CH, TH. Extralimital distribution: Australia (all states and territories, except Northern Territory), Lord Howe Island.

Biology. [Lowland to subalpine.] Collected on an extremely wide variety of native and introduced shrubs and low plants (including grasses, broom, sedge, clovers, pastoral vegetation in general), in unmodified or modified, forested or open environments. Nymphs and adults have been collected together on *Acaena novae-zelandiae*, mixed grass (e.g., roadside grass), mixed rainforest undergrowth and

Ozothamnus, which may indicate hostplant associations. Large numbers of adults have been recorded on *Hieracium*, *Brachyglottis cassinioides*, *Trifolium pratense* and *Urtica ferox*. The species has been reported on *Solanum tuberosum.* In Australia, it has also been recorded on a wide range of plants, including *Medicago sativa* crops, *Oxalis debilis*, *Stellaris media* and all kinds of garden plants and vegetables. Seasonality: November–June. [Parenchyma-feeder.] Wing condition: Macropterous. Economic importance: Grass species which ocasionally moves into commercial orchards.

References. Ghauri, 1963 (taxonomy; as *Zygina zealandica*). Evans, 1966 (key, taxonomy; as *Z. ansonae, Z. cyathea, Z. kiekie, Z. cyathea, Z. zealandica*). Metcalf, 1968: 1438 (catalogue, world; as *Zygina zealandica*). Knight, 1976a (biology, distribution, taxonomy; as *Zygina zealandica*). Wise, 1977: 81 (checklist, New Zealand; as *Zygina zealandica*). Day & Fletcher, 1994: 1232 (Australia, catalogue; as *Zygina zealandica*). Syrett & Smith, 1998 (biology; as *Zygina zealandica*). Charles, 2004 (economic importance; as *Zygina zealandica*). Fletcher & Larivière, 2009 (taxonomy, genitalia figures).

Notes. This is a common and widespread species in both New Zealand and Australia. It exists in a number of colour forms which were separated as distinct species by Myers (1923a). The status of these various colour forms needs to be examined in detail with their distributions.

Genus *Zygina* Fieber, 1866

(See Genus *Anzygina* Fletcher & Larivière, 2009)

Note. New Zealand species listed by previous authors under *Zygina* are now placed in the genus *Anzygina* Fletcher & Larivière, 2009.

Tribe TYPHLOCYBINI

Genus *Edwardsiana* Zachvatkin, 1929 [A]

Synonymy (see Metcalf, 1968; Oman *et al*., 1990; Day & Fletcher, 1994).

Geographic distribution. Nearctic Region, Palaearctic Region; adventive in Australia (continental, Tasmania) and New Zealand.

References. Evans, 1966 (Australia, key, New Zealand, taxonomy; as *Typhlocyba*). Metcalf, 1968: 966–1044 (catalogue, world). Knight, 1976a (New Zealand, taxonomy; as *Typhlocyba*). Wise, 1977 (checklist, New Zealand; as *Typhlocyba*). Oman *et al*., 1990: 208 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1229 (Australia, catalogue).

Notes. Contrary to the information published by Charles (1989), *Edwardsiana crataegi* (Douglas, 1876) is not recognised as a senior synonym of *E. froggatti.* In addition, the authors could not find any evidence of the occurrence of *E. crataegi* in New Zealand (see also **Appendix D**).

Edwardsiana froggatti (Baker, 1925) [A]

Synonymy (see Metcalf, 1968; Day & Fletcher, 1994).

Common names: Froggatt's Apple Leafhopper (New Zealand), Apple Leafhopper (mainland Australia), Canary Fly (Tasmania).

Geographic distribution (Map p. 208). North Island: AK, HB, WA, WI. South Island: MB, MC, NN. First New Zealand record: unknown locality, about 1918 (Dumbleton, 1934) Extralimital range: Australia (New South Wales, Tasmania), Nearctic Region, Palaearctic Region.

Biology. Lowland. Occurs predominantly on apple (*Malus spp*.), its hostplant; also found on *Crataegus* and *Rubus idaeus*. Seasonality: November–May (adults). Parenchyma-feeder. Wing condition: Macropterous. Economic importance: Pest in commercial apple orchards.

References. Dumbleton, 1934, 1937 (biology, control, economic importance, New Zealand). Evans, 1935 (biology, Tasmania). Cottier, 1956 (biology, New Zealand). Evans, 1966 (Australia, New Zealand, taxonomy; as *Typhlocyba froggatti*). Metcalf, 1968: 969–974 (catalogue, world; under *Typhlocyba australis*). Collyer & van Geldermalsen, 1975 (economic importance, New Zealand). Knight, 1976a (New Zealand, taxonomy; as *Typhlocyba froggatti*). Wise, 1977: 81 (checklist, New Zealand; as *Typhlocyba froggatti*). Teulon & Penman, 1984, 1986a–b, 1987 (biology, economic importance, New Zealand; as *Typhlocyba froggatti*). Charles, 1989 (biology, economic importance, New Zealand; as *E. crataegi*). Day & Fletcher, 1994: 1229 (Australia, catalogue). Charles, 2004 (economic importance).

Notes. *Edwardsiana crataegi* does not occur in New Zealand (see also **Appendix D**). New Zealand observations published by Charles (1989) for *E. crataegi* – thinking it to be a senior synonym of *E. froggatti* – could probably be inferred to *E. froggatti* directly, but information gathered by Charles on the biology and control of *E. crataegi* outside New Zealand may not necessarily apply to New Zealand populations of *E. froggatti*. More detailed information on biology and economic importance can be found in Teulon & Penman (1984–1987) and Charles (1989, 2004).

Edwardsiana lethierryi (Edwards, 1881) [A]

Synonymy (see Metcalf, 1968; Knight, 1976a).

Geographic distribution (Map p. 203). North Island: HB–Napier, Bluff Hill (NZAC). South Island: MC–Christchurch region (Knight, 1976a). First New Zealand record: Riccarton, MC, 1957 Dumbleton (1964).

Extralimital range: Nearctic Region, Palaearctic Region.

Biology. [Lowland.] Collected on *Aesculus hippocastanum* (as *A. hippoces*) in botanical gardens, *Betula alba* in nursery, *Citrus aurantifolia* and *Rubus idaeus* in the Christchurch region. Seasonality: December–February. [Parenchyma-feeder.] Wing condition: Macropterous.

References. Dumbleton, 1964 (biology, distribution). Evans, 1966 (Australia, New Zealand, taxonomy; as *Typhlocyba lethierryi*). Metcalf, 1968: 1004–1010 (catalogue, world). Knight, 1976a (New Zealand, taxonomy). Wise, 1977: 81 (checklist, New Zealand; as *Typhlocyba lethierryi*).

Note. The authors could not locate any of the specimens from the Christchurch region listed by Knight (1976a) as deposited in the DSIR (=NZAC) collection, although this does not put the occurrence of the species in that region into question.

Genus *Eupteryx* Curtis, 1833 [A]

Synonymy (see Metcalf, 1968; Nast, 1972).

Geographic distribution. Oriental Region, Palaearctic Region; New Zealand (adventive).

References. Metcalf, 1968: 1494–1502 (catalogue, world). Knight, 1976a (New Zealand, taxonomy). Oman *et al*., 1990: 211 (bibliography, checklist, genera, world).

Note. This taxon was not listed for Australia by Day & Fletcher (1994).

Eupteryx melissae Curtis, 1837 [A]

Synonymy (see Metcalf, 1968; Knight, 1976a).

Common name: Herb Leafhopper.

Geographic distribution (Map p. 203). North Island: AK–Auckland (Mt Albert (NZAC); Oratia (NZAC); Parnell (NZAC); Titirangi (NZAC)). HB–Napier (NZAC). South Island: MC–Christchurch (Knight, 1976a). Lincoln (NZAC). NN–Nelson (Atawhai Crescent (NZAC); Riwaka Research Station (NZAC)). Offshore Islands: CH–Chatham Island, Waitangi (NZAC). TH–Great Island (NZAC). First New Zealand records: MC, Christchurch, 1965 (NZAC); Dumbleton (1967). Extralimital range: Nearctic Region, Palaearctic Region.

Biology. Lowland. Collected on cat-mint (*Nepeta faassenii*), clare sage (*Salvia sclarea*), horehound (*Marrubium vulgare*), *Lavandula*, lemon balm (*Melissa officinalis*), mint (*Mentha*), sage (*Salvia officinalis*); also *Rosmarinus officinalis* (adults, one nymph) and in large numbers on *Alcea rosea* leaves. Seasonality: October–March, mostly January–February. [Parenchyma-feeder.] Wing condition: Macropterous. Economic importance: Potential pest of commercial herb gardens.

References. Dumbleton, 1967 (biology, distribution; as *Cicadella melissae*). Metcalf, 1968: 696–701, 1498 (catalogue, world; as *Cicadella melissae*). Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 81 (checklist, New Zealand). Charles, 2004 (economic importance).

Genus *Ribautiana* Zachvatkin, 1947 [A]

Synonymy (see Metcalf, 1968; Oman *et al*., 1990; Day & Fletcher, 1994).

Geographic distribution. Nearctic Region, Palaearctic Region (adventive elsewhere); Australian Region (continental Australia, Tasmania, New Zealand).

References. Metcalf, 1968: 907–933 (catalogue, world). Knight, 1976a (New Zealand, taxonomy). Wise, 1977: 81 (checklist, New Zealand). Fletcher & Williams, 1987 (Australia, distribution, taxonomy; *R. ulmi*). Oman *et al*., 1990: 248 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1230 (Australia, catalogue).

Ribautiana tenerrima (Herrich-Schäffer, 1834) [A]

Synonymy (see Metcalf, 1968; Larivière & Fletcher, 2004).

Common name: Bramble Leafhopper.

Geographic distribution (Map p. 209). North Island: AK–Auckland (Greenlane (NZAC); Mount Albert (NZAC); Te Atatu (NZAC); Titirangi (NZAC)). CL–Coroglen (NZAC). South Island: CO–"Central Otago" (Charles, 1989). MC–Riccarton (Knight, 1976a). Otahuna (Knight, 1976a). Selwyn Bridge (Knight, 1976a). Springston (Knight, 1976a). NN–Nelson (NZAC). WD–Alex Knob (NZAC). First New Zealand records: AK, Greenlane, 1949 (NZAC); MC, Lincoln, 1950 (Dumbleton 1964). Extralimital range: Nearctic Region, Palaearctic Region.

Biology. Lowland. Collected on *Rubus fruticosus*, *Quercus* (adults, nymphs), *Betula alba* (in nursery), *Rubus idaeus* (adults). Feeds on raspberries, boysenberries, blackberries, and wild brambles, the latter a huge food-reservoir outside commercial berryfruit gardens. Seasonality: November–April. [Parenchyma-feeder.] Wing condition: Macropterous. Economic importance: May be a minor pest in commercial berryfruit gardens; may be able to transfer phytoplasmas between *Rubus* plants.

References. Metcalf, 1968: 913–921 (catalogue, world). Knight, 1976a (biology, distribution, taxonomy). Wise, 1977: 81 (checklist, New Zealand). Charles, 1989 (biology). Wood *et* al., 1999 (economic importance, phytoplasmas). Charles, 2004 (economic importance, feeding).

Note. More detailed information on the biology of this species can be found in Charles (1989).

Subfamily ULOPINAE

References. Evans, 1937 (Australia, revision), 1947b (taxonomy). Metcalf, 1962b (catalogue, world). Evans, 1971b (Africa, taxonomy). Knight, 1973b (New Zealand, revision). Evans, 1977 (Australia, New Zealand, taxonomy). Wise, 1977 (checklist, New Zealand). Fletcher *et al.*, 1991b (Australia, overview; under Cicadelloidea). Day & Fletcher, 1994 (Australia, catalogue). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2002b (Australia, checklist; updated by Fletcher, 2006). Szwedo, 2002 (overview, Palaearctic Region). Larivière & Fletcher, 2004 (checklist, identification, New Zealand). Larivière, 2005 (checklist, New Zealand).

Tribe CEPHALELINI

Genus *Paracephaleus* Evans, 1942 N

Paracephaleus Evans, 1942b: 49. Type species: *Paracephaleus montanus* Evans, 1942b, by original designation. Synonymised with *Notocephalius* Jacobi, 1909, by Evans, 1947b: 145. Reinstated as valid genus by Evans, 1966: 93.

Geographic distribution. Australia (continental, Tasmania), New Zealand.

References. Metcalf, 1962b: 47–50 (catalogue, world; as *Notocephalius*). Knight, 1973b (New Zealand, revision). Evans, 1966 (Australia, key, New Zealand, taxonomy), 1977 (Australia, checklist, key, New Zealand). Wise, 1977: 76 (checklist, New Zealand). Day & Fletcher, 1994: 1126 (Australia, catalogue).

Note. Day & Fletcher (1994) recorded *P. montanus* (Evans, 1942b) from Tasmania and New Zealand but this species does not occur in New Zealand.

Paracephaleus curtus Knight, 1973 E

Type photograph p. 161.

Paracephaleus curtus Knight, 1973b: 985. Holotype male (NZAC); NN, Mount Augustus.

Geographic distribution (Map p. 207). North Island: TO–Mount Ruapehu, Chateau (NZAC). South Island: NN–Denniston (NZAC). Mount Augustus (NZAC).

Biology. [Montane, subalpine.] Collected on *Chionochloa rubra* (adults, both sexes) and from moss and mat plants (adults, nymphs). Seasonality: November, January, March. [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent or fully developed (latter known in females only).

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist, taxonomy). Wise, 1977: 76 (checklist, New Zealand).

Paracephaleus hudsoni (Myers, 1923) E

Type photograph p. 161.

Cephalelus hudsoni Myers, 1923a: 417. Holotype male (NZAC ex BMNH); WN, Wellington, Breaker Bay.

Cephalelus leptocarpi Myers, 1923a: 420. Holotype* male (BMNH); ND, Whangarei. Synonymised by Knight, 1973b: 982.

Notocephalius leptocarpi: Evans, 1947b: 148.

Notocephalius hudsoni: Evans, 1947b: 148.

Paracephaleus hudsoni: Evans, 1966: 94.

Paracephaleus leptocarpi: Evans, 1966: 94.

Paracephaleus hudsoni: Knight, 1973b: 982.

Geographic distribution (Map p. 207). North Island: AK, CL, ND, TO, WN. South Island: BR, DN–near Palmerston (NZAC), NN.

Biology. [Lowland, often coastal.] Collected on *Leptocarpus simplex* [=*Apodasmia similis*] (adult female) and *Empodisma minus* (adult female, 2 nymphs) in gumlands (ND), strongly suggesting that Restionaceae are used as hostplants. Also found on tidal flats, in hot pools, and in swamps. Seasonality: October–February, June (adults); November (nymphs). [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent or fully developed (latter known in females only).

References. Metcalf, 1962b: 48–49 (catalogue, world; as *Notocephalius hudsoni, N. leptocarpi*). Evans, 1966 (checklist; as *Paracephaleus hudsoni* and *P. leptocarpi*). Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist, taxonomy). Wise, 1977: 76 (checklist, New Zealand).

Tribe ULOPINI

Genus *Novolopa* Evans, 1966 E

Novolopa Evans, 1966: 88. Type species: *Novolopa townsendi* Evans, 1966, by original designation.

Geographic distribution. New Zealand.

References. Knight, 1973b (revision). Evans, 1977 (checklist). Wise, 1977: 76 (checklist, New Zealand).

Notes. *Novolopa* species are mainly ground-dwelling insects living among leaf litter, grass and mats of low growing plants; hindwings are absent in all known species.

Novolopa falcata Knight, 1973 E

Type photograph p. 156.

Novolopa falcata Knight, 1973b: 975. Holotype male (NZAC); FD, Turret Range, Mount Grey.

Geographic distribution (Map p. 205). South Island: CO–Rock and Pillar Range (NZAC). FD–Fiordland National Park, Lake Orbell (South side) (NZAC). Hunter Mountains (Monowai (NZAC); Mount Burns (Knight, 1973b); South Borland Range (Knight, 1973b)). Turret

Range (Knight, 1973b) (Mount Grey (Knight, 1973b); Percy Saddle (South of) (Knight, 1973b)).

Biology. [Montane, alpine.] Collected on *Pimelea* (adults of both sexes, nymphs), *Gaultheria*, various mat plants, grass (adults, both sexes); also on and under *Helichrysum* [=*Anaphalioides*] *bellidioides* or in leaf litter in general (adults). [Hostplant: *Pimelea*.] Seasonality: November–January. [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 76 (checklist, New Zealand).

Novolopa infula Knight, 1973 E

Type photograph p. 156.

Novolopa infula Knight, 1973b: 976. Holotype male (NZAC); FD, Wilmot Pass, Mount Barber.

Geographic distribution (Map p. 205). South Island: FD–Turret Range (Knight, 1973b), Mount Grey (Knight, 1973b). Wilmot Pass, Mount Barber (NZAC).

Biology. [Subalpine, alpine.] Collected in grass and on mat plants. Seasonality: January. [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 76 (checklist, New Zealand).

Novolopa kuscheli Knight, 1973 E

Type photograph p. 156.

Novolopa kuscheli Knight, 1973b: 978. Holotype male (NZAC); Stewart Island, Mount Rakeahua.

Geographic distribution (Map p. 205). South Island: FD–Wilmot Pass (Knight, 1973b). Stewart Island: Big South Cape Island (North Peak (Knight, 1973b); South Peak (Knight, 1973b)). Mount Rakeahua (NZAC). Table Hill (Knight, 1973b).

Biology. [Montane (lower), subalpine.] Collected at base of *Celmisia*, in cushion plants and mat plants. Seasonality: November, January, February (mostly). [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 76 (checklist, New Zealand).

Novolopa maculata Knight, 1973 E

Type photograph p. 156

Novolopa maculata Knight, 1973b: 976. Holotype male (NZAC); OL, Queenstown, Mount Coronet [=Coronet Peak].

Geographic distribution (Map p. 205). South Island: FD–Hunter Mountains, Monowai (Knight, 1973b). Turret Range (Knight, 1973b), Mount Grey (Knight, 1973b). OL–Coronet Peak (NZAC). Mataura [River] Valley (E of Eyre Mountains) (NZAC).

Biology. [Subalpine, alpine.] Collected on *Drapetes* [=*Kelleria*] (adults of both sexes, nymph), on *Celmisia ramulosa*, *Dracophyllum*, and in leaf litter (adults). [Hostplant: *Kelleria*.] Seasonality: November–January (mostly), February. [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Wise, 1977: 76 (checklist, New Zealand).

Novolopa montivaga Knight, 1973 E

Type photograph p. 157.

Novolopa montivaga Knight, 1973b: 978. Holotype male (NZAC); CO, Old Man Range.

Geographic distribution (Map p. 205). South Island: CO–Old Man Range (Knight, 1973b), Hyde Rocks (15 km S of Alexandra) (NZAC). Rock and Pillar Range (NZAC) (Leaning lodge (NZAC); Red Hut (NZAC)). SL–Blue Mountains (NZAC). Upper Mataura Valley (NZAC).

Biology. [Subalpine, alpine.] Collected on *Celmisia sessiliflora* on swards (adults of both sexes, nymphs). Seasonality: September–March. [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist). Wise, 1977: 76 (checklist, New Zealand).

Novolopa townsendi Evans, 1966 E

Type photograph p. 157.

Novolopa townsendi Evans, 1966: 88. Holotype female (NZAC); NN, Mount Owen.

Geographic distribution (Map p. 205). South Island: NN–Ben Nevis (NZAC). Mount Arthur (NZAC). Mount Domett (NZAC). Mount Owen (NZAC).

Biology. [Subalpine, alpine.] Collected in leaf litter and on *Blechnum penna-marina*. Seasonality: November–March. [Phloem-feeder.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Wise, 1977: 76 (checklist, New Zealand).

Subfamily XESTOCEPHALINAE

Tribe XESTOCEPHALINI

Genus *Xestocephalus* Van Duzee, 1892 N

Xestocephalus Van Duzee, 1892: 298. Type species: *Xestocephalus pulicarius* Van Duzee, 1894, designated by Distant, 1908: 348.

Nesotettix Lindberg, 1936: 6. Type species: *Nesotettix freyi* Lindberg, 1936, by original designation. Preoccupied.

Lindbergana Metcalf, 1952: 229. Replacement name for *Nesotettix* Lindberg. Synonymised by Linnavuori, 1959: 36.

Geographic distribution. Worldwide.

References. Evans, 1966 (Australia, key, New Zealand, taxonomy). Metcalf, 1967c: 2355–2380 (catalogue, world). Knight, 1974b (New Zealand, taxonomy). Wise, 1977: 79 (checklist, New Zealand). Oman *et al*., 1990: 260 (bibliography, checklist, genera, world). Day & Fletcher, 1994: 1222–1223 (Australia, catalogue).

Xestocephalus ovalis Evans, 1966 E

Xestocephalus ovalis Evans, 1966: 256. Holotype* female (MONZ; could not be located); WN, Wellington.

Geographic distribution (Map p. 209). North Island: AK, BP, CL, GB, HB, ND, RI, TO, WI, WN, WO. South Island: BR, CO, DN, FD, MC, MK, NC, NN, OL, SC, SD, SL, WD. Offshore Islands: CH, TH.

Biology. [Lowland, montane.] Collected mostly on grasses, rushes, and sedges in open, often marshy habitats such as pastures, forest clearings, coastal or montane environments; also on *Cyathea*, moss, *Raoulia*; in leaf litter or in rotten wood (in winter or at higher altitude). Seasonality: Throughout the year, mostly January–March. [Phloem-feeder.] Wing condition: Submacropterous, nearly macropterous.

References. Evans, 1966 (biology, taxonomy). Knight, 1974b (biology, distribution, taxonomy), 1976a (biology, distribution). Wise, 1977: 79 (checklist, New Zealand).

Notes. The female holotype is supposed to be deposited in MONZ but could not be located by Knight (1974b), the present authors, nor MONZ's curator (R. Palma, personal communication). Four species of this genus occur in Australia (Day & Fletcher, 1994). According to Knight (1974b), an illustration of the male genitalia of *X. australensis* Kirkaldy given by Evans (1966) suggests that *X. ovalis* may be conspecific with the Australian species.

Family MEMBRACIDAE

Horned treehoppers

References. Goding, 1903 (Australia, revision). Zimmerman, 1948 (Hawaii, revision). Kato, 1960 (Micronesia, revision). Metcalf & Wade, 1963 (bibliography, world). Metcalf & Wade, 1965 (catalogue, world). Evans, 1966 (Australia, revision). Broomfield, 1971 (BMNH types). Eyles, 1971 (family record, New Zealand). Strumpel, 1972 (phylogeny, world). Wise, 1977 (checklist, New Zealand). Fletcher *et al*., 1991b (Australia, overview; under Cicadelloidea). Deitz & Dietrich, 1993 (classification, world). Dietrich & Deitz, 1993 (phylogeny, world). Day, 1999 (Australia, genera, review). Dietrich *et al.*, 2001a–b (morphological and molecular phylogeny, world). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2002b (Australia, checklist; updated by Fletcher, 2006). Larivière & Fletcher, 2004 (checklist, identification, New Zealand). Wallace & Deitz, 2004 (phylogeny, systematics; world Centrotinae). Larivière, 2005 (checklist, New Zealand).

Subfamily CENTROTINAE

Reference. Wallace & Deitz, 2004 (phylogeny, systematics, world).

Tribe TERENTIINI

Reference. Wallace & Deitz, 2006 (Australia, biogeography, phylogeny).

Genus *Acanthuchus* Stål, 1866 A

Acanthuchus Stål, 1866a: 87. Type species: *Centrotus trispinifer* Fairmaire, 1846 designated by Stål, 1866b: 386.

Geographic distribution. Australia (continental, Tasmania), western Indonesia, India; New Zealand (adventive).

References. Metcalf & Wade, 1965: 227–232 (catalogue, world). Evans, 1966 (Australia, key, taxonomy). Wise, 1977: 82 (checklist, New Zealand). Day & Fletcher, 1994: 1249–1250 (Australia, catalogue). Wallace & Deitz, 2006 (biogeography, phylogeny).

Acanthuchus trispinifer (Fairmaire, 1846) A

Centrotus trispinifer Fairmaire, 1846: 515. Syntype(s)* status and repository undetermined; Australia.

Acanthucus [*sic*] *trispinifer*: Stål, 1866b: 386.

Acanthuchus gracilispinus Stål, 1869: 287. Syntype(s) female(s)* (NHRM); "Australia borealis." Synonymised by Evans, 1966: 295.

Geographic distribution (Map p. 219). North Island: AK–Auckland (Bastion Point (NZAC); Greenlane

(NZAC)). South Island: BR–Cobden Beach (NZAC). Kokiri (NZAC). NN–Mawhera State Forest, Wallaby Creek (NZAC). First New Zealand record: BR–Kokiri, 1971 (NZAC; Eyles, 1971). Extralimital range: Australia (continental, Tasmania).

Biology. [Lowland.] Collected on *Chrysanthemoides monilifera* (adults, nymphs; in numbers), *Rubus idaeus* (adults, nymphs); also on *Cytisus–Cotoneaster* association, *Coprosma robusta*, *Rubus australis* (adults only). Hostplant (Australia): *Acacia decurrens* (Mimosaceae). Seasonality: December–March, May. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Metcalf & Wade, 1965: 231–232 (catalogue, world). Evans, 1966 (Australia, taxonomy). Eyles, 1971 (biology, distribution, New Zealand). Wise, 1977: 82 (checklist, New Zealand). Cookson & New, 1980 (Australia, biology). Day & Fletcher, 1994: 1250 (Australia, catalogue).

Family MYERSLOPIIDAE
Ground-dwelling leafhoppers

References. Metcalf, 1962b (catalogue, world; as *Myerslopia*). Knight, 1973b (New Zealand, revision). Evans, 1977 (Australia, New Zealand, taxonomy). Wise, 1977 (checklist, New Zealand). Fletcher *et al*., 1991b (Australia, overview; under Cicadelloidea). Day & Fletcher, 1994 (Australia, catalogue). Hamilton, 1999b (classification, family status, genera, New Zealand). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2002b (Australia, checklist; updated by Fletcher, 2006). Larivière & Fletcher, 2004 (checklist, identification, New Zealand). Szwedo, 2004a (Chile, New Zealand, taxonomy), 2004b (world checklist, distribution, origin). Cryan, 2005 (classification, phylogeny). Larivière, 2005 (checklist, New Zealand).

Notes. Adults and nymphs are ground-dwelling, generally wingless leafhoppers occurring in decomposing leaf litter, soil debris with high organic content or moss growing in open or forested environments. Myerslopiidae are believed to be fungivores (Szwedo, 2004b) but a predacious life style has also been hypothesised for *Mapuchea chilensis* (Nielson, 1996) which, if true, would be an exception within the Auchenorrhyncha.

Subfamily MYERSLOPIINAE
Tribe MYERSLOPIINI

Genus *Myerslopia* Evans, 1947 [E]

Myerslopia Evans, 1947b: 143. Type species: *Myerslopia magna* Evans, 1947b, by original designation.

Geographic distribution. New Zealand.

References. Evans, 1947b (description, ecology, wing condition). Metcalf, 1962b: 95 (catalogue, world). Evans, 1966 (New Zealand, taxonomy). Knight, 1973b (revision). Wise, 1977: 76 (checklist, New Zealand). Hamilton, 1999b (biogeography, classification, taxonomy). Szwedo, 2004b: 4 (checklist, world).

Note. Some undescribed species from Chile, previously reported as possibly belonging to *Myerslopia* (e.g., Evans, 1961; Hamilton, 1999b), have now been placed in the genus *Mapuchea* Szwedo, 2004a, with *Myerslopia chilensis* Nielson, 1996, as the type species.

Myerslopia magna amplificata Knight, 1973 [E]

Type photograph p. 187.

Myerslopia magna amplificata Knight, 1973b: 1004. Holotype male (NZAC); BR, Punakaiki, Bullock Creek.

Geographic distribution (Map p. 219). South Island: BR–Punakaiki, Bullock Creek.

Biology. [Lowland.] Habitat: Unknown. Seasonality: October. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Wise, 1977: 76 (checklist, New Zealand). Szwedo, 2004b: 4 (checklist, world; distribution, New Zealand).

Myerslopia magna magna Evans, 1947 [E]

Type photograph p. 187.

Myerslopia magna Evans, 1947b: 144. Holotype female (NZAC ex BMNH); TO, Waimarina [=Waimarino River].

Myerslopia magna magna: Knight, 1973b: 988.

Geographic distribution (Map p. 219). North Island: HB, TK, TO. South Island: MB, NN, SD.

Biology. [Montane, subalpine.] Collected in leaf litter, mixed moss and mat plants, and on *Celmisia* (adults, nymphs); also in moss from clay banks. Seasonality: August–January, March. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings vestigial.

References. Metcalf, 1962b: 95 (catalogue, world; as *Myerslopia magna*). Evans, 1966 (taxonomy; as *Myerslopia magna*). Knight, 1973b (biology, distribution, taxonomy; as *Myerslopia magna*). Wise, 1977: 76 (checklist, New Zealand; as *Myerslopia magna* and *M. magna magna*). Szwedo, 2004b: 4 (checklist, world; distribution, New Zealand).

Myerslopia magna scabrata Knight, 1973 [E]

Type photograph p. 187.

Myerslopia magna scabrata Knight, 1973b: 1003. Holotype male (NZAC); FD, Wilmot Pass.

Geographic distribution (Map p. 219). South Island: FD–Hollyford Valley ("7 miles into") (Knight, 1973b). Wilmot Pass (NZAC).

Biology. [Montane.] Collected in moss, on mat plants, on *Polystichum vestitum* (adults, nymphs); in leaf litter. Seasonality: January–February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Wise, 1977: 77 (checklist, New Zealand). Szwedo, 2004b: 4 (checklist, world; distribution, New Zealand).

Myerslopia rakiuraensis Szwedo, 2004 E

Type photograph p. 187.

Myerslopia rakiuraensis Szwedo, 2004a: 11. Holotype male (NZAC ex MHNG); Stewart Island, Oban.

Geographic distribution (Map p. 220). Stewart Island: Oban.

Biology. [Lowland.] Collected in podocarp-broadleaf forest, in fern gully (adults, nymphs). Seasonality: February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

Reference. Szwedo, 2004b: 4 (checklist, world; biology, distribution, New Zealand).

Myerslopia tawhai Szwedo, 2004 E

Type photograph p. 188.

Myerslopia tawhai Szwedo, 2004a: 14. Holotype female (NZAC ex MHNG); SL, Longwood Range.

Geographic distribution (Map p. 220). South Island: SL–Longwood Range.

Biology. [Lowland.] Collected in *Nothofagus menziesii* forest. Seasonality: February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

Reference. Szwedo, 2004b: 4 (checklist, world; biology, distribution, New Zealand).

Note. The holotype is a female specimen, not a male as stated by Szwedo (2004a); male unknown.

Myerslopia tearohai Szwedo, 2004 E

Type photograph p. 188.

Myerslopia tearohai Szwedo, 2004a: 17. Holotype female (NZAC ex MHNG); BP, Mount Te Aroha.

Geographic distribution (Map p. 220). North Island: BP–Mount Te Aroha.

Biology. [Montane.] Collected in *Nothofagus menziesii* forest. Seasonality: February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

Reference. Szwedo, 2004b: 4 (checklist, world; biology, distribution, New Zealand).

Myerslopia triregia Knight, 1973 E

Type photograph p. 188.

Myerslopia triregia Knight, 1973b: 1005. Holotype male (NZAC); TH, Great Island, Tasman Valley.

Geographic distribution (Map p. 220). Offshore Islands: TH–Great Island, Tasman Valley.

Biology. [Lowland.] Collected in leaf litter (adults, nymphs). Seasonality: November. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition). Evans, 1977 (checklist; as *Myerslopia aspera*). Wise, 1977: 77 (checklist, New Zealand). Szwedo, 2004b: 4 (checklist, world; distribution, New Zealand).

Myerslopia whakatipuensis Szwedo, 2004 E

Type photograph p. 188.

Myerslopia whakatipuensis Szwedo, 2004a: 13. Holotype male (NZAC ex MHNG); FD, Fiordland National Park, Hollyford Valley, Lake Marian Track.

Geographic distribution (Map p. 220). South Island: FD–Fiordland National Park, Hollyford Valley, Lake Marian Track.

Biology. [Lowland.] Habitat: Unknown. Seasonality: February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

Reference. Szwedo, 2004b: 4 (checklist, world; biology, distribution, New Zealand).

Genus *Pemmation* Hamilton, 1999 E

Pemmation Hamilton, 1999b: 226. Type species: *Myerslopia parva* Evans, 1947b, by original designation.

Geographic distribution. New Zealand.

References. Evans, 1966 (New Zealand, taxonomy; as *Myerslopia*). Hamilton, 1999b (biogeography, classification, taxonomy). Szwedo, 2004b: 4 (checklist, world).

Pemmation asperum asperum (Knight, 1973) E

Type photograph p. 189.

Myerslopia aspera Knight, 1973b: 998. Holotype male (NZAC); WN, Otaki Forks.

Myerslopia aspera aspera Knight, 1973b: 999.

Myerslopia aspersa: Evans, 1977: 102.

Pemmation aspera [*sic*]: Hamilton, 1999b: 227.

Pemmation aspera [*sic*] *aspera* [*sic*]: Szwedo, 2004b: 4.

Geographic distribution (Map p. 220). North Island: WA–Aorangi Mountains, Haurangi (Knight, 1973b; as *Myerslopia aspera*). Pori (Knight, 1973b; as *Myerslopia aspera*). WN–East Tararuas [=Tararua Range], Mount Holdsworth track (Knight, 1973b; as *Myerslopia aspera*). Otaki Forks (NZAC).

Biology. [Lowland, montane] Collected in leaf litter (adults, nymphs); also in moss from forest (e.g., *Nothofagus*). Seasonality: September, February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia aspera*). Evans, 1977 (checklist; as *Myerslopia aspera*). Wise, 1977: 76 (checklist, New Zealand; as *Myerslopia aspera* and *Myerslopia aspera aspera*). Szwedo, 2004b: 4 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation asperum cognatum (Knight, 1973) [E]

Type photograph p. 189.

Myerslopia aspera cognata Knight, 1973b: 998. Holotype male (NZAC); MC, [Christchurch] McLennans Bush.

Pemmation aspera [*sic*] *cognata* [*sic*]: Szwedo, 2004b: 4.

Geographic distribution (Map p. 220). South Island: MC–McLennans Bush (NZAC). Sharplin Falls, Bowyers Stream (NZAC).

Biology. [Lowland, montane.] Collected in moss. Seasonality: February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia aspera cognata*). Wise, 1977: 76 (checklist, New Zealand; as *Myerslopia aspera cognata*). Szwedo, 2004b: 4 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation bifurca (Knight, 1973) [E]

Type photograph p. 189.

Myerslopia bifurca Knight, 1973b: 994. Holotype male (NZAC); AK, Waitakere Ranges.

Myerslopia bifurcata [*sic*]: Evans, 1977: 102.

Pemmation bifurca: Hamilton, 1999b: 227.

Geographic distribution (Map p. 220). North Island: AK–Huia (Knight, 1973b; as *Myerslopia bifurca*). Waitakere Ranges (NZAC). CL–Kirikiri Saddle (NZAC).

Biology. [Lowland, montane (lower).] Collected in forest leaf litter. Seasonality: October, January, April, August. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia bifurca*). Evans, 1977 (checklist; as *Myerslopia bifurcata* [*sic*]). Wise, 1977: 76 (checklist, New Zealand; as *Myerslopia bifurca*). Szwedo, 2004b: 5 (checklist, world).

Note. The localities listed by Knight, 1973b, Huia and Waitakere Ranges, are from the Auckland area, not Northland as indicated by Szwedo (2004b).

Pemmation insulare (Knight, 1973) [E]

TPP 189.

Myerslopia insularis Knight, 1973b: 992. Holotype male (NZAC); NN, Nelson, Waimea West, Eves Valley, Palmers Bush.

Pemmation insularis [*sic*]: Hamilton, 1999b: 227.

Geographic distribution (Map p. 220). South Island: NN–Nelson, Waimea West, Eves Valley, Palmers Bush (NZAC). Tasman Bay, Fisherman's Island [=Fisherman Island] (Knight, 1973b; as *Myerslopia insularis*).

Biology. [Lowland.] Collected in forest leaf litter (adults, nymphs). Seasonality: October, July. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia insularis*). Evans, 1977 (checklist; as *Myerslopia insularis*). Wise, 1977: 76 (checklist, New Zealand; as *Myerslopia insularis*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation montis (Knight, 1973) [E]

Type photograph p. 190.

Myerslopia montis Knight, 1973b: 994. Holotype male (NZAC); SD, Mount Stokes.

Pemmation montis: Hamilton, 1999b: 227.

Geographic distribution (Map p. 221). South Island: SD–Mount Stokes.

Biology. [Montane.] Collected in forest leaf litter and moss. Seasonality: March. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia montis*). Evans, 1977 (checklist; as *Myerslopia montis*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia montis*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Pemmation parvum (Evans, 1947) [E]

Type photograph p. 190

Myerslopia parva Evans, 1947b: 144. Holotype female (NZAC ex BMNH); TO, Ohakune.

Pemmation parva [*sic*]: Hamilton, 1999b: 227.

Pemmation parvus [*sic*]: Szwedo, 2004b: 5.

Geographic distribution (Map p. 221). North Island: AK, BP, CL, GB, HB, RI, TO, WA, WN, WO. South Island: BR, MB, NN, SD, WD.

Biology. Lowland, subalpine. Collected mostly in moss and leaf litter, also on mat plants, e.g, *Raoulia* (adults and nymphs); also in forested and open habitats such as broadleaf or *Nothofagus* forests, tussock grasslands, rock faces and banks. [Hostplant: *Raoulia*.] Seasonality: Throughout the year, mostly October–February. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Metcalf, 1962b: 95 (catalogue, world; as *Myerslopia parva*). Evans, 1966 (taxonomy; as *Myerslopia parva*). Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia parva*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia parva*). Szwedo, 2004a, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation simile (Knight, 1973) [E]

Type photograph p. 190.

Myerslopia similis Knight, 1973b: 994. Holotype male (NZAC); WD, Mount Hercules.

Pemmation similis [*sic*]: Hamilton, 1999b: 227.

Geographic distribution (Map p. 221). South Island: WD–Arthur's Pass, Temple Basin (Knight, 1973b; as *Myerslopia similis*). Lake Ianthe State Forest (NZAC). Lake Kaniere (Knight, 1973b; as *Myerslopia similis*). Mount Hercules (NZAC).

Biology. [Lowland to subalpine.] Collected in forest leaf litter and moss (e.g., moss from banks). Seasonality: November, May. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia similis*). Evans, 1977 (checklist; as *Myerslopia similis*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia similis*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation terrestre (Knight, 1973) [E]

Type photograph p. 190.

Myerslopia terrestris Knight, 1973b: 1000. Holotype male (NZAC); WN, Orongorongo Field Station.

Pemmation terrestris [*sic*]: Hamilton, 1999b: 227.

Geographic distribution (Map p. 221). North Island: WA–Lake Wairarapa (Northwest side) (Knight, 1973b; as *Myerslopia terrestris*). Tauweru (7 miles E) (Knight, 1973b; as *Myerslopia terrestris*). WN–Makara (Knight, 1973b; as *Myerslopia terrestris*). Orongorongo Field/Research Station (NZAC). Somes Island (NZAC).

Biology. [Lowland.] Collected mostly in forest leaf litter (adults, nymphs); also in moss (e.g., from ground and roots). Seasonality: September, December, February, May. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia terrestris*). Evans, 1977 (checklist; as *Myerslopia terrestris*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia terrestris*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation townsendi (Knight, 1973) [E]

Type photograph p. 191.

Myerslopia townsendi Knight, 1973b: 995. Holotype male (NZAC); WD, Lake Wahapo.

Pemmation townsendi: Hamilton, 1999b: 227.

Geographic distribution (Map p. 221). South Island: CO, DN, FD, NN, SL, WD.

Biology. Lowland to subalpine. Collected in moss and leaf litter, in forests (e.g., *Dracophyllum* or *Nothofagus* forests) and in tussock grasslands. Seasonality: September–April. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia townsendi*). Evans, 1977 (checklist; as *Myerslopia townsendi*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia townsendi*). Szwedo, 2004a, 2004b: 5 (checklist, world; biology, distribution, New Zealand.

Note. Contrary to the distribution given by Szwedo (2004b), this species has not been recorded from the Mackenzie region of the South Island.

Pemmation variabile austrinum (Knight, 1973) [E]

Type photograph p. 191.

Myerslopia variabilis austrina Knight, 1973b: 997. Holotype male (NZAC); SC, Waimate, Kelsey's Bush [=Kelceys Bush].

Pemmation variabilis [*sic*] *austrina* [*sic*]: Szwedo, 2004b: 5.

Geographic distribution (Map p. 221). South Island: SC–Waimate, Kelceys Bush (NZAC). SL–Birch Island (NZAC).

Biology. [Lowland.] Collected in leaf litter. Seasonality: December–January. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia variabilis austrina*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia variabilis austrina*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation variabile variabile (Knight, 1973) [E]

Type photograph p. 191.

Myerslopia variabilis Knight, 1973b: 997. Holotype male (NZAC); NN, Takaka Hill.

Myerslopia variabilis variabilis: Knight, 1973b: 999.

Pemmation variabilis [*sic*]: Hamilton, 1999b: 227.

Pemmation variabilis [*sic*] *variabilis* [*sic*]: Swedo, 2004b: 5.

Geographic distribution (Map p. 221). South Island: BR, NN, WD.

Biology. [Montane (lower), subalpine.] Collected in forest leaf litter (e.g., *Nothofagus* forest); also mat samples from *Celmisia discolor* and *Chionochloa australis* (adults, nymphs). Seasonality: September–December, March–April, July. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia variabilis*). Evans, 1977 (checklist; as *Myerslopia variabilis*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia variabilis* and *M. variabilis variabilis*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Pemmation verrucosum (Knight, 1973) [E]

Type photograph p. 191.

Myerslopia verrucosa Knight, 1973b: 1000. Holotype male (NZAC); WI, Hunterville, Bruce Park.

Pemmation verrucosa [*sic*]: Hamilton, 1999b: 227.

Geographic distribution (Map p. 221). North Island: RI–Taihape (NZAC). TO–Erua (NZAC). National Park (NZAC). Ohakune (NZAC). Raurimu (Knight, 1973b; as *Myerslopia verrucosa*). Taumarunui (Knight, 1973b; as *Myerslopia verrucosa*). WI–Hunterville, Bruce Park (NZAC). WN–Tararua Range, Judd Ridge, Otaki Forks (NZAC).

Biology. Lowland, montane. Collected in forest leaf litter (adults, nymphs); also mixed leaf litter and moss. Seasonality: November–January. [Fungivore.] Wing condition: Forewings nearly macropterous, coriaceous; hindwings absent.

References. Knight, 1973b (biology, distribution, taxonomy, wing condition; as *Myerslopia verrucosa*). Evans, 1977 (checklist; as *Myerslopia verrucosa*). Wise, 1977: 77 (checklist, New Zealand; as *Myerslopia verrucosa*). Szwedo, 2004b: 5 (checklist, world; distribution, New Zealand).

Note. *Pemmation* is a neuter noun, therefore requiring an adjective with a neuter ending.

Infraorder FULGOROMORPHA

References. Wilson, 2005 (keys to families, Nearctic). Bourgoin, 2008 (checklist, world). Fletcher, 2009 (Australasia, keys to families).

Superfamily FULGOROIDEA

Family ACHILIDAE

Achilid planthoppers

References. Muir, 1927 (revision, Samoa). Metcalf, 1948 (catalogue, world). Fennah, 1950a (revision of genera), 1950b (Fiji, revision), 1956 (Micronesia, revision), 1969 (New Caledonia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Emeljanov, 1991 (classification, world). Fletcher & Carver, 1991 (Australia, overview; under Fulgoroidea). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2003 (Australia, checklist; updated 2006). Emeljanov, 2005 (Australia, taxonomy). Larivière, 2005 (checklist, New Zealand). Fletcher, 2009 (Australia, key to tribes).

Subfamily ACHILINAE

Tribe ACHILINI

Genus *Achilus* Kirby, 1818 [A]

Achilus Kirby, 1818: 474. Type species: *Achilus flammeus* Kirby, 1818, by monotypy.

Geographic distribution. Australia (New South Wales, Queensland, South Australia, Victoria); New Zealand (adventive).

References. Metcalf, 1948: 19–22 (catalogue, world). Fennah, 1950a (Australia, nomenclature, taxonomy). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Note. According to Fennah (1950a), the only species in the genus is the type, *A. flammeus*.

Achilus flammeus Kirby, 1818 [A]

Achilus flammeus Kirby, 1818: 475.

Common names: Red Fungus Bug, Red Fingernail Bug.

Geographic distribution (Map p. 199). North Island: AK–Auckland (NZAC) (Browns Bay (NZAC); Mount Eden). First New Zealand records: Auckland, 1946 (Turbott & Woodward, 1954), 1954 (NZAC). Extralimital range: Australia (New South Wales, Queensland, South Australia, Victoria).

Biology. [Lowland.] Collected in urban settings, e.g., on a washing line, in a shop, on the floor of a restaurant. In Australia, nymphs have been found in termite mounds. Seasonality: February–August. Fungivore (nymph); phloem-feeder (adult). Wing condition: Macropterous.

References. Metcalf, 1948: 21–22 (catalogue, world). Turbott & Woodward, 1954 (Australia, biology, distribution, New Zealand). Wise, 1977: 70 (checklist, New Zealand). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher, 2009 (Australia, checklist, distribution, identification).

Notes. Turbott & Woodward (1954) noted that the apparent restriction of this species to an area close to wharves supported its relatively recent introduction. He also observed that all specimens he had examined had been females. NZAC has only a few specimens collected in Auckland in 1964, 1991 and 1997. The bright red colouration is limited to the adults; the nymphs are dark brown.

Tribe PLECTODERINI

Genus *Agandecca* White, 1879 E

Agandecca White, 1879: 217. Type species: *Agandecca annectens* White, 1879, by monotypy.

Geographic distribution. New Zealand.

References. Metcalf, 1948: 13–14 (catalogue, world). Fennah, 1950a (distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification).

Agandecca annectens White, 1879 E

Agandecca annectens White, 1879: 218. Lectotype* male (designated by Deitz, in Deitz & Helmore, 1979; Perth Museum and Art Gallery, Scotland); New Zealand.

Geographic distribution (Map p. 199). North Island: AK, BP, GB, HB, ND, TK, TO, WI, WN. South Island: BR, FD, MB, MC, NC, NN, OL, SD, WD.

Biology. Lowland to subalpine. Found in and around native forests and shrublands (mostly podocarps and/or *Nothofagus*), including *Agathis australis* forest undergrowth, on *Cassinia* [=*Ozothamnus*?] and *Olearia*, on *Collospermum*, on *Nothofagus* (including *N. fusca* and *N. menziesii*), and on subalpine vegetation; also collected on grass and on *Phormium*. Seasonality: September, October–December (mostly), January–March. [Fungivore (nymph); phloem-feeder (adult).] Wing condition: Macropterous.

References. Metcalf, 1948: 13–14 (catalogue, world). Fennah, 1950a (taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Notes. Fennah (1950a) illustrated a specimen which he referred to as the "holotype" of *A. annectens*, but Deitz & Helmore (1979) obtained the syntype series from the Perth Museum and Art Gallery, Scotland, and designated a lectotype. Fennah's reference to a holotype does not represent a lectotype designation by default because it is unclear to which specimen Fennah (1950a) referred.

Family CIXIIDAE

Cixiid planthoppers

References. Muir, 1927 (revision, Samoa). Metcalf, 1936 (catalogue, world), 1946a (Guam, revision). Zimmerman, 1948 (Hawaii, revision). Fennah, 1950b (Fiji, revision), 1956 (Micronesia, revision), 1969 (New Caledonia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Emeljanov, 1989 (classification, world). Hoch & Howarth, 1989a–b (Australia, cavernicolous taxa). Fletcher & Carver, 1991 (Australia, overview; under Fulgoroidea). Larivière, 1997a (New Zealand, overview), 1999 (New Zealand, revision). Emeljanov, 2000 (Australia and vicinity, New Zealand, taxonomy). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Emeljanov, 2002 (classification, phylogeny, world). Holzinger *et al*., 2002 (overview, world). Fletcher & Watson, 2003 (Australia, checklist; updated 2006). Larivière, 2005 (checklist, New Zealand). Hoch, 2006a (Hawaii, taxonomy), 2006b (Polynesia, taxonomy). Löcker *et al*., 2006a (Australia, taxonomy; Mnemosynini), 2006b (Australia, key; Pentastirini), 2006c (Australia, revision; Pentastirini), 2006d (Australia, phylogeny, revision; Gelastocephalini), 2006e (Australia, key; Gelastocephalini), 2007a (Australia, revision; Brixiini, in part.), 2007b (Australia, revision; Andini). Ceotto & Bourgoin, 2008 (classification, phylogeny, world).

Subfamily CIXIINAE

Tribe CIXIINI

Genus *Aka* White, 1879 N

Aka White, 1879: 216. Type species: *Cixius finitimus* Walker, 1858a, by original designation.

Geographic distribution. Australia (continental, Tasmania), New Zealand.

References. Metcalf, 1936: 123–124 (catalogue, world). Larivière, 1999 (New Zealand, revision).

Aka dunedinensis Larivière, 1999 [E]

Type photograph p. 178.

Aka dunedinensis Larivière, 1999: 19. Holotype male (NZAC): DN, Ross Creek Reservoir.

Geographic distribution (Map p. 214). South Island: DN–Dunedin (AMNZ). Ross Creek Reservoir (NZAC). SL–Hokonui Hills, Dolamore Park (NZAC). Owaka (NZAC).

Biology. Montane (lower). Habitat poorly known; two specimens recorded from *Nothofagus* forest (SL, Owaka) and from ferns (SL, Dolamore Park). Seasonality: January–February, April. [Phloem-feeder.] Wing condition: Submacropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy).

Note. See under *Aka finitima*.

Aka duniana (Myers, 1924) [E]

Type photograph p. 178.

Malpha duniana Myers, 1924b: 323. Holotype male (NZAC ex BMNH); NN, Dun Mountain.

Aka duniana: Fennah, 1975a: 380.

Geographic distribution (Map p. 214). North Island: HB, TO, WN. South Island: KA, MC, NN, SD.

Biology. Lowland (often coastal), montane. Occurs on ground cover or shrubs, in and at the margins of *Nothofagus* or mixed forests, shrublands and scrublands. Seasonality: September–July, mostly December–February. [Phloem-feeder.] Wing condition: Submacropterous.

References. Myers, 1924b (biology; as *Malpha duniana*). Metcalf, 1936: 43 (catalogue, world; as *Malpha duniana*). Larivière, 1999 (biology, distribution, taxonomy).

Notes. This species has often been confused with *Aka finitima* prior to 1999. Additional information on taxonomy, distribution and biology can be found in Larivière (1999). See also **Notes** under *Aka finitima*.

Aka finitima (Walker, 1858) [E]

Cixius finitimus Walker, 1858a: 81. Holotype female (BMNH); New Zealand [=Auckland, see **Notes**].

Aka finitima: White, 1879: 216.

Geographic distribution (Map p. 214). North Island: AK, BP, CL, ND, RI, TO, WI, WN.

Biology. Lowland (often coastal), montane (lower). Recorded from *Nothofagus* (*N. fusca, N. menziesii*) forests or mixed forests, shrublands, and scrublands; also collected on *Coprosma* (mostly) and *Xeronema*. Seasonality: December–May. [Phloem-feeder.] Wing condition: Submacropterous.

References. Metcalf, 1936: 123–124 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy).

Notes. The holotype was collected by Lieutenant Colonel D. Bolton and bears the BMNH accession number 54.4; such specimens are likely to be from Auckland (see Dugdale, 1988). Myers (1924b) redescribed this species from several specimens from "Wellington District, Tararua Range, Canterbury and Dunedin". Larivière (1999) established that these specimens belonged to *Aka duniana*, except for the Dunedin specimens, which were of *Aka dunedinensis*. *Aka finitima* is a North Island species while *Aka duniana* is found on both sides of the Cook Strait, in southern areas of the North Island (with a disjunct distribution on the Central Volcanic Plateau) and in northern areas of the South Island. Additional information on taxonomy, distribution and biology can be found in Larivière (1999).

Aka rhodeae Larivière, 1999 [E]

Type photograph p. 178.

Aka rhodei [*sic*] Larivière, 1999: 21. Holotype male (NZAC); TO, Pureora [State Forest Park], Waipapa Reserve.

Geographic distribution (Map p. 214). North Island: RI–Mangahuia Stream (NZAC). TO–Pureora State Forest Park, Waipapa Reserve (NZAC). WO–Waikato-Waipakihi Rivers junction (NZAC).

Biology. Montane (lower). Collected in shrubland terrace with pumice soil and a dominant vegetation of *Dracophyllum subulatum*, *Coprosma*, and *Pseudopanax* (TO, Pureora State Forest Park). Seasonality: November–March, mostly December and February. [Phloem-feeder.] Wing condition: Submacropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy).

Note. The original spelling of the specific name created by Larivière (1999) was incorrect; it should have been of feminine gender.

Aka westlandica Larivière, 1999 [E]

Type photograph p. 178.

Aka westlandica Larivière, 1999: 22. Holotype male (NZAC); FD, Thompson Sound, Bauza Island.

Geographic distribution (Map p. 214). South Island: BR, CO, FD, MC, NN, OL, SL,WD. Stewart Island.

Biology. Lowland (often coastal), montane (lower). Occurs in and at the margins of *Nothofagus* or mixed forests, shrublands, and scrublands; often collected on *Coprosma* in coastal areas or by sweeping ferns (e.g., *Blechnum*) in forested areas; also recorded from the native plants *Ascarina lucida, Carpodetus serratus, Melicytus, Schefflera digitata, Pseudopanax crassifolius, P. simplex* [=*Raukaua simplex*], tree ferns, and *Weinmannia racemosa.* Males and females have also been collected at night on *Blechnum capense*

(FD, March). Seasonality: October–March, mostly December–February. [Phloem-feeder.] Wing condition: Submacropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Genus *Cermada* Emeljanov, 2000 [E]

Cermada Emeljanov, 2000: 251. Type species: *Cixius kermadecensis* Myers, 1924b, by original designation.

Geographic distribution. New Zealand.

Reference. Larivière, 1999 (key to species, New Zealand, revision; as *Cixius*).

Notes. The scant taxonomic knowledge available on *Cixius* in general, and on Australian taxa in particular, did not allow Larivière (1999) to consider an alternative generic affiliation for New Zealand taxa previously placed in the cosmopolitan genus *Cixius*. Emeljanov (2000) described the genus *Cermada* to accommodate four New Zealand species (*Cixius aspilus, C. kermadecensis, C. punctimargo*, and *C. interior*) apparently overlooking the facts that Larivière (1999) had already invalidated the name *C. aspilus* by finding its holotype to be a hybrid, recognised *C. interior* to be a junior synonym of *C. punctimargo,* and described two new species (*Cixius inexspectatus*, *C. triregius*). However, Emeljanov's paper is labelled "Received August 29, 1999" and it may be a simple case of publication overlap with Larivière's monograph published in November 1999. Nevertheless, this situation resulted in creating more confusion and doubt as to the correct generic affiliation of New Zealand "*Cixius*" species. The species *Cixius inexspectatus* and *C. triregius* have been compared, using museum specimens, against the description of the genus *Cermada* published by Emeljanov (2000), its type species (*C. kermadecensis*), and specimens of *Cermada punctimargo*. As a result two new combinations are made here. Emejanov (2000) also noted that species from New Caledonia, described by Distant in the genus *Cixius*, may also be of this genus.

Cermada inexspectata (Larivière, 1999) [E] new combination

Type photograph p. 179.

Cixius inexspectatus Larivière, 1999: 25. Holotype male (NZAC); TO, Pureora [State Forest Park], Waipapa Reserve.

Cixius aspilus Walker, 1858a [part]. Synonymised by Larivière, 1999: 25.

Geographic distribution (Map p. 214). North Island: AK, CL, ND, TO.

Biology. Lowland (often coastal), montane (lower). Occurs in scrublands, shrublands, and open broadleaf or mixed broadleaf-podocarp forests; collected frequently on *Melicytus*, *Coprosma*, and *Pseudopanax*. Seasonality: September–March, mostly December–January. [Phloem-feeder.] Wing condition: Macropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy; as *Cixius inexspectatus*).

Notes. This is the species listed as *Cixius aspilus* Walker, 1858, by Emeljanov (2000: 252), the name of which had already been invalidated by Larivière (1999) because it was based on an animal shown to be a hybrid. Additional information on distribution can be found in Larivière (1999).

Cermada kermadecensis (Myers, 1924) [E]

Type photograph p. 179.

Cixius kermadecensis Myers, 1924b: 319. Holotype female (NZAC ex BMNH); Kermadec Islands, Sunday Island [=Raoul Island] (Myers, 1924b).

Cermada kermadecensis: Emeljanov, 2000: 251.

Geographic distribution (Map p. 214). Offshore Islands: KE.

Biology. Mostly unknown. Collected on *Macropiper excelsum*. [Phloem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1936: 180 (catalogue, world). Larivière, 1999 (checklist, New Zealand; as *Cixius kermadecensis*).

Cermada punctimargo (Walker, 1858) [E]

Cixius punctimargo Walker, 1858a: 81. Holotype* female (BMNH); New Zealand [=Auckland, see **Notes**].

Cixius interior Walker, 1858a: 82. Holotype* female (BMNH); New Zealand [=Auckland, see **Notes**]. Synonymised by Larivière, 1999: 26; incorrectly used as a valid name by Emeljanov, 2000: 252.

Cermada punctimargo: Emeljanov, 2000: 252.

Geographic distribution (Map p. 215). North Island: AK, BP, CL, GB, ND.

Biology. Lowland (often coastal), montane (lower). Occurs in scrublands, shrublands, and open broadleaf or mixed podocarp-broadleaf forests; collected frequently on *Melicytus*, *Coprosma*, and *Pseudopanax*. Seasonality: September–January, mostly November. [Phloem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1936: 207 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy; as *Cixius punctimargo*).

Notes. The holotype was collected by Lieutenant Colonel D. Bolton and bears the BMNH accession number 54.4; such specimens are likely to be from Auckland (see Dugdale, 1988). Additional information on distribution can be found in Larivière (1999).

Cermada triregia (Larivière, 1999) E new combination

Type photograph p. 179.

Cixius triregius Larivière, 1999: 27. Holotype male (NZAC); Three Kings Islands, Great Island, Castaway Camp.

Geographic distribution (Map p. 215). Offshore Islands: TH–Great Island (NZAC); Castaway Camp (AMNZ, MONZ, NZAC), Summit Ridge (NZAC); Tasman Valley (NZAC). West Island (NZAC).

Biology. Lowland (coastal). Scrublands and shrublands; found in association with *Myoporum laetum* and *Solanum aviculare* var. *albiflorum*. Seasonality: November, January. [Phloem-feeder.] Wing condition: Macropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy; as *Cixius triregius*).

Genus *Chathamaka* Larivière, 1999 E

Chathamaka Larivière, 1999: 23. Type species: *Chathamaka andrei* Larivière, 1999, by original designation.

Geographic distribution. New Zealand (Chatham Islands only).

Reference. Larivière, 1999 (taxonomy).

Chathamaka andrei Larivière, 1999 E

Type photograph p. 179.

Chathamaka andrei Larivière, 1999: 23. Holotype male (NZAC); CH, Pitt Island, Glory Scenic Reserve.

Geographic distribution (Map p. 215). Offshore Islands: CH–Pitt Island (CMNZ, NZAC): Cannister Cove Scientific Reserve (LUNZ, MONZ, NZAC); Glory Bay (NZAC); Glory Scenic Reserve (LUNZ); Kaingaroa (CMNZ); Waipaua–Glory Bay (LUNZ).

Biology. Lowland (coastal). Occurs in podocarp-broadleaf forests, shrublands, and scrublands; collected on vegetation in regenerating *Dracophyllum* forest, shrubs (*Brachyglottis huntii, Coprosma chathamica, Melicytus chathamicus, Myoporum*), the edge of a remnant forest, and herbs and grasses hanging from coastal rocks. Seasonality: November–February. [Phloem-feeder.] Wing condition: Macropterous or submacropterous, with forewings welded together dorsally in some individuals.

Reference. Larivière, 1999 (biology, distribution, taxonomy).

Genus *Cixius* Latreille, 1804

(See Genus *Cermada* Emeljanov, 2000)

Reference. Metcalf, 1936: 148–223 (catalogue, world).

Note. New Zealand species listed by Larivière (1999) and previous authors under *Cixius* are now placed in the genus *Cermada* Emeljanov, 2000.

Genus *Confuga* Fennah, 1975 E

Confuga Fennah, 1975a: 377. Type species: *Confuga persephone* Fennah, 1975a, by original designation.

Geographic distribution. New Zealand.

Reference. Larivière, 1999 (taxonomy).

Confuga persephone Fennah, 1975 E

Confuga persephone Fennah, 1975a: 379. Holotype* male (NZAC, presumably lost); NN, Takaka, Council Cave. The holotype could not be located; it may have been lost in the 2004 move of NZAC from Mt Albert to St Johns (Auckland).

Geographic distribution (Map p. 215). South Island: NN–Council Cave, Takaka.

Biology. Subterranean. Occurs in limestone caves. Seasonality: October–June. Food: Roots of trees which penetrate well below the limestone surface. [Phloem-feeder.] Wing condition: Submacropterous.

References. Millar, 1998 (feeding). Larivière, 1999 (biology, distribution, taxonomy).

Notes. Nymphs of a very similar planthopper found in a cave at Paynes Ford Scenic Reserve, several kilometres west of Council Cave, appear to be of the same genus, perhaps even the same species. It seems likely that the same species, or similar species, will eventually turn up in other limestone sites in the same region (Millar, 1998).

Genus *Huttia* Myers, 1924 E

Huttia Myers, 1924b: 321. Type species: *Huttia nigrifrons* Myers, 1924b, by original designation.

Geographic distribution. New Zealand.

References. Metcalf, 1936: 42–43 (catalogue, world). Larivière, 1999 (revision).

Note. Larivière (1999) showed the female holotype of *Huttia harrisi* Myers, 1924b, to be conspecific with *Semo westlandiae* Larivière & Hoch, 1998 (see *Semo harrisi*).

Huttia nigrifrons Myers, 1924 E

Type photograph p. 180.

Huttia nigrifrons Myers, 1924b: 321. Holotype female (NZAC); WN, Upper Hutt.

Geographic distribution (Map p. 215). North Island: AK, BP, CL, ND, TO, WN.

Biology. Lowland. Inhabits mixed podocarp-broadleaf forests and their margins, where it is mostly found on podocarp trees; also beaten from coastal shrubs, swept from podocarps (*Dacrydium cupressinum, Halocarpus kirkii*), collected on *Prumnopitys ferruginea* (branch trap), and once found on a young tree fern. Seasonality: October–

May, mostly October– November. [Phloem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1936: 43 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy).

Notes. Additional information on distribution can be found in Larivière (1999). This species is rather widely distributed on the North Island, but it is never locally abundant. Along with *Semo* species, this is the only New Zealand cixiid for which a close association with Podocarpaceae is suspected.

Huttia northlandica Larivière, 1999 E

Type photograph p. 180.

Huttia northlandica Larivière, 1999: 30. Holotype male (NZAC); ND, Omahuta State Forest.

Geographic distribution (Map p. 215). North Island: ND–Omahuta State Forest (MONZ, NZAC). Mataraua Forest, Waioku Coach Road track (NZAC). Waipoua State Forest (MONZ, NZAC), South Highway 12 (AMNZ). Warawara State Forest (AMNZ, NZAC).

Biology. [Lowland.] Habitat unknown, but probably similar to that of *H. nigrifrons*. Seasonality: September–October, July. [Phloem-feeder.] Wing condition: Macropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy).

Genus *Koroana* Myers, 1924 E

Koroana Myers, 1924b: 319. Type species: *Cixius rufifrons* Walker, 1858a, designated by Larivière, 1999: 30, and resurrected from synonymy with *Cixius interior*.

Geographic distribution. New Zealand.

References. Metcalf, 1936: 146–147 (catalogue, world). Larivière 1997b, 1999 (revision).

Koroana arthuria Myers, 1924 E

Type photograph p. 180.

Koroana arthuria Myers, 1924b: 320. Holotype male (NZAC ex BMNH); NC, Arthur's Pass.

Geographic distribution (Map p. 215). South Island: FD, MC, MK, NC, OL, SL. Stewart Island.

Biology. Lowland, montane (higher). Occurs at the margins of forests and shrublands; collected frequently on *Hebe* (including *H. odora*), also on *Cassinia* [=*Ozothamnus*?], *Coprosma parviflora, Metrosideros*, *Olearia avicenniifolia,* and *Brachyglottis buchananii*; found in numbers under stones, in some cases in association with small ants (nymphs). Seasonality: November–February, mostly late January–February. [Phloem-feeder.] Wing condition: Macropterous.

References. Myers, 1924b (ant-association, biology). Metcalf, 1936: 147 (catalogue, world). Larivière, 1997b, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Koroana lanceloti Larivière, 1997 E

Type photograph p. 180.

Koroana lanceloti Larivière, 1997b: 221. Holotype male (NZAC); OL, Dart Hut.

Geographic distribution (Map p. 215). South Island: BR, CO, FD, MB, MK, NN, OL, WD.

Biology. Lowland to subalpine. Occurs in forest margins and shrublands; collected regularly on *Olearia* (including *O. moschata, O. avicenniifolia, O. lacunosa*), *Hebe* (especially *H. salicifolia* and *H. subalpina*), and *Coprosma*; other associated plant records include *Carmichaelia, Cassinia,* and *Aristotelia fruticosa*. Seasonality: November–April, July. [Phloem-feeder.] Wing condition: Macropterous.

References. Larivière, 1997b, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Koroana rufifrons (Walker, 1858) E

Cixius interior Walker, 1858a: 82. Incorrect synonymy of Myers, 1927: 689.

Cixius rufifrons Walker, 1858a: 83. Holotype male (BMNH); New Zealand. Resurrected from synonymy with *Cixius interior* by Larivière, 1999: 33.

Koroana helena Myers, 1924b: 319. Holotype male [presumed from original description] ("Myers collection, Department of Agriculture" [but probably in BMNH]); [type locality not mentioned] (Myers, 1924b). Synonymised by Myers, 1927: 689.

Koroana interior: Myers, 1927: 689. Incorrect combination.

Koroana interior: Larivière, 1997b: 219.

Koroana rufifrons: Larivière, 1999: 33.

Geographic distribution (Map p. 215). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. South Island: BR, KA, MB, MC, NN, SD, SL.

Biology. Lowland (coastal), montane (lower). Occurs on trees and shrubs of forest margins and shrublands, often at the sides of streams; frequently collected on *Hebe parviflora* and other *Hebe* species (including *H. stricta* and *H. divaricata*) and on *Melicytus ramiflorus*; found less frequently on *Coriaria arborea, Fuchsia* and, on rare occasions, *Hoheria, Metrosideros, Nothofagus, Pittosporum, Pseudowintera,* or *Weinmannia*; large numbers of newly-emerged individuals collected in November in mixed vegetation of *Fuchsia-Melicytus-Hebe* in the Waimana Valley

(Urewera National Park, BP) near a stream at the edge of a mixed podocarp-broadleaf forest. Seasonality: October–April, mostly January–February (adults). [Phloem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1936: 147 (catalogue, world; *Koroana interior*). Larivière, 1997b, 1999 (biology, distribution, taxonomy).

Notes. The holotype was collected by Lieutenant Colonel D. Bolton and bears the BMNH accession number 54.4; such specimens are likely to be from Auckland (see Dugdale, 1988). Additional information on distribution can be found in Larivière (1999).

Genus *Malpha* Myers, 1924 E

Malpha Myers, 1924b: 322. Type species: *Malpha muiri* Myers, 1924b, by original designation.

Geographic distribution. New Zealand.

Reference. Larivière, 1999 (revision).

Malpha cockcrofti Myers, 1924 E

Type photograph p. 181.

Malpha cockcrofti Myers, 1924b: 323. Holotype female (NZAC ex BMNH); WD, Otira.

Geographic distribution (Map p. 216). South Island: BR–Buller Gorge, Dublin Terrace (NZAC). Fletcher Creek (NZAC). Paparoa Range: adjacent Croesus Knob (NZAC); Buckland Peaks (NZAC). WD–Otira (NZAC).

Biology. Montane (lower), subalpine. Mostly found in subalpine environments in the South Island. [Hostplant: *Olearia colensoi* on which specimens of both sexes collected (January, Croesus Knob).] One other specimen recorded from *Celimisia* flowers (November, Buckland Peaks). Seasonality: November, January. [Phloem-feeder.] Wing condition: Macropterous.

References. Myers, 1924b (biology, taxonomy). Metcalf, 1936: 43 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy).

Malpha muiri Myers, 1924 E

Type photograph p. 181.

Malpha muiri Myers, 1924b: 322. Holotype male (NZAC ex BMNH); WN, Mount Alpha.

Malpha iris Myers, 1924b: 323. Holotype female (NZAC); WN, York Bay. Synonymised by Larivière, 1999: 36.

Geographic distribution (Map p. 216). North Island: WN–Tararua Range, Mount Alpha (NZAC). York Bay (NZAC). South Island: BR–Lewis Pass (NZAC).

Biology. Lowand, montane (lower). Taken from the undergrowth of shrubby *Senecio* and *Olearia* in *Nothofagus* forest. Seasonality: November. [Phloem-feeder.] Wing condition: Macropterous.

References. Myers, 1924b (biology, taxonomy). Metcalf, 1936: 43 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy).

Tribe OECLEINI

Genus *Tiriteana* Myers, 1924 E

Tiriteana Myers, 1924b: 325. Type species: *Tiriteana clarkei* Myers, 1924b, by original designation.

Geographic distribution. New Zealand.

References. Metcalf, 1936: 244 (catalogue, world). Larivière, 1999 (taxonomy).

Tiriteana clarkei Myers, 1924 E

Tiriteana clarkei Myers, 1924b: 325. Holotype* female (BMNH); BP, Mamaku.

Geographic distribution (Map p. 216). North Island: AK, BP, CL, GB, ND, TK, TO, WN, WO.

Biology. Lowland, montane. Found mainly in or at the edge of podocarp-broadleaf forests (e.g., *Beilschmiedia tarairi* forests); recorded from *Coprosma rhamnoides*, other *Coprosma* species, and *Carpodetus serratus* (in large numbers). [Hostplant: *Carpodetus serratus*; tenerals collected in numbers in December (Wanganui National Park, TK).] Seasonality: October–February, mostly January. [Phloem-feeder.] Wing condition: Macropterous.

References. Metcalf, 1936: 244 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy).

Tribe PENTASTIRINI

References. Löcker *et al*., 2006b (Australia, key), 2006c (Australia, revision).

Genus *Oliarus* Stål, 1862

(See Genus *Zeoliarus* Larivière & Fletcher, 2008)

Note. New Zealand species listed by previous authors under *Oliarus* are now placed in the genus *Zeoliarus* Larivière & Fletcher, 2008.

Genus *Zeoliarus* Larivière & Fletcher, 2008 E

Zeoliarus Larivière & Fletcher, 2008: 67. Type species: *Oliarus atkinsoni* Myers, 1924b, by original designation.

Geographic distribution. New Zealand.

References. Metcalf, 1936: 44–108 (catalogue, world; as

Oliarus). Larivière, 1999 (New Zealand, revision; as *Oliarus*). Emeljanov, 2001 (classification, Oriental Region, taxonomy; as *Oliarus* sensu stricto). Hoch, 2005 (classification, definition, type species; *Oliarus*). Löcker *et al*., 2006c (Australia, revision; as *Oliarus*).

Notes. Emeljanov (2001) and Hoch (2005) have clarified the definition of *Oliarus* Stål, 1862, *sensu stricto*. Löcker *et al*. (2006c) established the identities of Australian Pentastirini.

Zeoliarus atkinsoni (Myers, 1924) E

Oliarus atkinsoni Myers, 1924b: 325. Holotype* male (BMNH); WN, Gollans Valley.

Zeoliarus atkinsoni: Larivière & Fletcher, 2008: 66.

Common name: Flax Planthopper.

Geographic distribution (Map p. 216). North Island: AK, BP, CL, ND, TK, TO, WN. South Island: BR–Springs Junction (south end of Palmers Road) (NZAC).

Biology. Lowland. Occurs in *Phormium* marshes where it can be found, often in copula, on the shaded side of *Phormium* leaves. Seasonality: November–March. Economic importance: Vector of the Yellow Leaf Disease of *Phormium*. Phloem-feeder (mostly). Wing condition: Macropterous.

References. Metcalf, 1936: 53 (catalogue, world). Cumber, 1952b–d, 1953a–d, 1954a–c (biology, disease vector, distribution, life cycle). Larivière, 1999 (biology, distribution, taxonomy).

Note. For additional information on life cycle, biology, ecology, distribution, and the role of this species as disease vector, see Larivière (1999).

Zeoliarus oppositus (Walker, 1851) E

Cixius oppositus Walker, 1851a: 345. Holotype* male (BMNH); New Zealand.

Oliarus oppositus: White, 1879: 216.

Cixius marginalis Walker, 1858a: 82. Syntypes* status uncertain (BMNH); Walker's original description indicates that the species is based on two specimens, "a, b. New Zealand. Presented by Colonel Bolton." Synonymised by Myers, 1927: 690.

Zeoliarus oppositus: Larivière & Fletcher, 2008: 66.

Geographic distribution (Map p. 217). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, OL, SC, SD, SL, WD. Stewart Island. Offshore Islands: TH.

Biology. Lowland to subalpine. Occurs in natural, as well as modified, habitats (e.g., marshes, grasslands, grassy forest clearings, pastures), on low herbage (especially grasses) rather than bushes like most of the New Zealand Cixiidae. Seasonality: October–April, mostly summer months. Phloem-feeder. Wing condition: Macropterous.

References. Metcalf, 1936: 87–88 (catalogue, world). Larivière, 1999 (biology, distribution, taxonomy).

Note. This is the most commonly encountered cixiid in New Zealand.

Tribe SEMONINI

Genus *Parasemo* Larivière, 1999 E

Parasemo Larivière, 1999: 37. Type species: *Parasemo hutchesoni* Larivière, 1999, by original designation.

Geographic distribution. New Zealand.

Reference. Larivière, 1999 (taxonomy).

Parasemo hutchesoni Larivière, 1999 E

Type photograph p. 181.

Parasemo hutchesoni Larivière, 1999: 37. Holotype male (NZAC); TO, Pureora [State Forest Park], Waipapa Reserve.

Geographic distribution (Map p. 216). North Island: BP–Mount Te Aroha (BMNH, NZAC). TO–Pureora State Forest Park, Waipapa Reserve (AMNZ, MONZ, NZAC).

Biology. Lowland, montane (lower). Collected in podocarp-broadleaf shrublands. Seasonality: October–December. [Phloem-feeder.] Wing condition: Macropterous.

Reference. Larivière, 1999 (biology, distribution, taxonomy).

Genus *Semo* White, 1879 E

Semo White, 1879: 217. Type species: *Semo clypeatus* White, 1879, by monotypy.

Geographic distribution. New Zealand.

References. Metcalf, 1936: 116 (catalogue, world). Larivière & Hoch, 1998 (revision). Larivière, 1999 (revision).

Semo clypeatus White, 1879 E

Semo clypeatus White, 1879: 217. Lectotype* male (designated by Deitz, in Deitz & Helmore, 1979; Perth Museum and Art Gallery, Scotland); New Zealand.

Geographic distribution (Map p. 216). North Island: GB, TK, TO. South Island: BR, MB, MC, NC, NN.

Biology. Montane, subalpine. Occurs in shrublands and grasslands, often in the vicinity of streams; found on *Hebe stricta* (tenerals and fully mature adults); also on *Brachyglottis eleagnifolius*, *Cassinia vauvilliersii*

[=*Ozothamnus leptophyllus*], *Coprosma-Olearia* associations, *Dracophyllum longifolium*, *Hebe-Uncinia* associations, *Nothofagus fusca*, tussocks, and mat plants. [Hostplant: *Halocarpus biformis* on which large numbers were taken in late December in subalpine scrubland at the summit of Mount Pureora (TO).] Seasonality: November–February, mostly November and January. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Metcalf, 1936: 116 (catalogue, world). Larivière & Hoch, 1998 (biology, distribution, taxonomy). Larivière, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Semo harrisi (Myers, 1924) E

Type photograph p. 181.

Huttia harrisi Myers, 1924b: 322. Holotype female (NZAC ex BMNH); [WD] "West Coast", South Island.

Semo westlandiae Larivière & Hoch, 1998: 440. Holotype male (NZAC); BR–Mount Sewell. Synonymised by Larivière, 1999: 40.

Semo harrisi: Larivière, 1999: 40.

Geographic distribution (Map p. 216). South Island: BR, DN, FD, MK, NC, NN, OL, SL, WD. Stewart Island.

Biology. Montane, subalpine. Occurs in shrublands and grasslands, often in the vicinity of streams; on Stewart Island, apparently in podocarp-broadleaf forest. Found mostly on *Dracophyllum* (including *D. traversii* and *D. longifolium*) and *Coprosma propinqua* (tenerals and adults), which may act as hostplants. In addition, adults have been recorded on *Hebe*, *Olearia ilicifolia*, tussock, and other, yet undetermined, subalpine plants. Seasonality: November–February, mostly December. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Metcalf, 1936: 43 (catalogue, world; as *Huttia harrisi*). Larivière & Hoch, 1998 (biology, distribution, taxonomy). Larivière, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Semo southlandiae Larivière & Hoch, 1998 E

Type photograph p. 182.

Semo southlandiae Larivière & Hoch, 1998: 436. Holotype male (NZAC); SL, Takitimu Range, Tower Peak.

Geographic distribution (Map p. 216). South Island: DN–Berwick State Forest, Meggat Burn (OMNZ). MC–Porters Pass (NZAC). Staveley (NZAC). MK–Mount Cook National Park (LUNZ). SL–Blue Mountains (OMNZ). Mokoreta No. 2 (NZAC). Mount Hedgehope (NZAC). Slopedown Range (NZAC). Takitimu Range: Cheviot Hills Face (NZAC); Tower Peak (LUNZ).

Biology. Montane, subalpine. Occurs in shrublands and grasslands, often in the vicinity of streams; found on *Coprosma-Cassinia-Dracophyllum* associations in tussocks, *Hebe odora*, vegetation surrounding bogs and in a *Nothofagus* forest. Seasonality: December–February, mostly January. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Larivière & Hoch, 1998 (biology, distribution, taxonomy). Larivière, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Semo transinsularis Larivière & Hoch, 1998 E

Type photograph p. 182.

Semo transinsularis Larivière & Hoch, 1998: 438. Holotype male (NZAC); WN, Tararua Range, Dundas Hut.

Geographic distribution (Map p. 216). North Island: RI–Ruahine Range, Shuteye Camp (NZAC). TO–Tongariro National Park: Mount Ruapehu (NZAC). Ohakune (NZAC). WN–Tararua Range: Dundas Hut/Ridge (MONZ, NZAC); Logan E Basin (NZAC). South Island: BR–Fletcher Creek (NZAC). NN–Mount Arthur Range (NZAC): Balloon Hut (NZAC); Flora Track (NZAC).

Biology. Montane, subalpine. Occurs in shrublands and grasslands, often in the vicinity of streams; found mostly on *Chionochloa* (tenerals and adults); also on *Hebe rakaiensis, Olearia lacunosa,* and *Nothofagus* (adults). Seasonality: November–February, mostly December and February. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Larivière & Hoch, 1998 (biology, distribution, taxonomy). Larivière, 1999 (biology, distribution, taxonomy).

Note. Additional information on distribution can be found in Larivière (1999).

Family DELPHACIDAE

Delphacid planthoppers

References. Muir, 1927 (revision, Samoa). Metcalf, 1943 (catalogue, world), 1946a (Guam, revision). Zimmerman, 1948 (Hawaii, revision). Fennah, 1950b (Fiji, revision), 1956 (Micronesia, revision), 1965 (Australia, New Zealand, revision), 1969 (New Caledonia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Donaldson, 1983 (Australia, taxonomy), 1988 (Australia, New Caledonia, taxonomy). Fletcher & Carver, 1991 (Australia, overview; under

Fulgoroidea). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Dijkstra *et al*., 2003 (molecular phylogeny, world). Fletcher & Watson, 2003 (Australia, checklist; updated 2006). Larivière, 2005 (checklist, New Zealand).

Note. New Zealand Delphacidae are in great need of revision and probably the most poorly known fulgoroid group in this country.

Subfamily ASIRACINAE

References. Donaldson, 1983 (Australia, revision), 1988 (Australia, New Caledonia, taxonomy).

Tribe UGYOPINI

Genus *Ugyops* Guérin-Méneville, 1834 N

Ugyops Guérin-Méneville, 1834: 477. Type species: *Ugyops percheronii* Guérin-Méneville, 1834, by monotypy.

Hygiops Amyot & Audinet-Serville, 1843: 511. Emendation for *Ugyops* Guérin-Méneville, 1834. Synonymised by Agassiz, 1848: 1105.

Bidis Walker, 1857: 88. Type species: *Bidis notivena* Walker, 1857, by monotypy. Synonymised by Stål, 1866a: 175 (as *Hygyops* [*sic*]).

Geographic distribution. Australian Region (continental Australia, Lord Howe Island, Norfolk Island, New Zealand, South Pacific islands), Oriental Region.

References. Metcalf, 1943: 40–47 (catalogue, world). Fennah, 1965 (Australia, New Zealand, taxonomy). Wise, 1977: 69 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Dijskstra *et al*., 2003 (molecular phylogeny).

Subgenus *Paracona* Fennah, 1965 E

Paracona Fennah, 1965: 11. Type species: *Ugyops* (*Paracona*) *pelorus* Fennah, 1965, by original designation.

Geographic distribution. New Zealand (main islands, KE).

References. Fennah, 1965 (taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Ugyops (*Paracona*) *pelorus* Fennah, 1965 E

Type photograph p. 185.

Ugyops (*Paracona*) *pelorus* Fennah, 1965: 11. Holotype male (AMNZ); BP, Ohope Beach.

Geographic distribution (Map p. 218). North Island: AK, BP, CL, GB, ND, WI, WN. South Island: MC, SD. Offshore Islands: CH, KE, TH.

Biology. Lowland, coastal. Collected mostly on *Muehlenbeckia* (adults, nymphs), including *M. australis*; also on flowering *Metrosideros kermadecensis*, on *Hebe* (including *H. bollonsii*), *Phormium tenax*, *Cotula*, various coastal plants, and under *Mariscus* [=*Cyperus*]. [Hostplant: *Muehlenbeckia*.] Seasonality: October–March, June; mostly November–January. [Phloem-feeder.] Wing condition: Brachypterous.

References. Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Ugyops (*Paracona*) *raouli* (Muir, 1923) E

Micromasoria raouli Muir, 1923a: 257. Syntypes (3)* (MONZ; series could not be located); KE, Raoul Island.

Ugyops (*Paracona*) *raouli*: Fennah, 1965: 12.

Geographic distribution (Map p. 218). Offshore Islands: KE–Raoul Island.

Biology. Lowland, coastal. Collected from *Rhopalostylis sapida* fronds. Seasonality: Unknown. [Phloem-feeder.] Wing condition: Brachypterous.

References. Muir, 1923a (wing condition). Metcalf, 1943: 122 (catalogue, world; as *Micromasoria raouli*). Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Notes. According to Muir (1923a) this species was "described from one male, one female and a nymph from Raoul Island (Sunday Island), Kermadec Archipelago." These specimens were said to be deposited in the Dominion Museum, Wellington [=MONZ], and to have been collected during the W.R.B. Oliver expedition to the Kermadecs in 1908 by Mr W.L. Wallace. Only two specimens from 1908 were found in MONZ, both of them females, and bearing the label information 'cro.2.', 'Kermadec Is. 1908', 'M. raouli Muir'. Whether one of these two females is part of the syntype series used by Muir to describe *Micromasoria raouli* remains uncertain.

Subgenus *Ugyops* Guérin-Méneville, 1834 N

See Genus above.

Ugyops (*Ugyops*) *caelatus* (White, 1879) E

Cona caelata White, 1879: 218. Lectotype male (Perth Museum Scotland; designated by Fennah 1980: 76); "New Zealand", type locality unknown.

Micromasoria caelata: Kirkaldy, 1909a: 29.

Livatis celata [*sic*]: Jacobi, 1928: 43.

Ugyops [(*Ugyops*)] *caelatus*: Fennah, 1965: 7.

Geographic distribution (Map p. 218). North Island: AK, BP, CL, ND, WI, WN. Offshore Islands: TH.

Biology. Lowland, often coastal. Collected on *Kunzea ericoides, Muehlenbeckia australis* (adults); *Coprosma rhamnoides, Knightia excelsa, Leptospermum* (nymphs); flowering prostrate *Metrosideros*, small-leaved *Muehlenbeckia* (adults, nymphs). [Hostplants: *Metrosideros*, *Muehlenbeckia*.] Seasonality: September–May, mostly January. [Phloem-feeder.] Wing condition: Brachypterous to macropterous.

References. Metcalf, 1943: 122 (catalogue, world; as *Micromasoria caelata*). Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Ugyops (*Ugyops*) *rhadamanthus* Fennah, 1965 E

Type photograph p. 185.

Ugyops [(*Ugyops*)] *rhadamanthus* Fennah, 1965: 9. Holotype male (NZAC); AK, [Waitakere Ranges] Nihotupu.

Geographic distribution (Map p. 219). North Island: AK, BP, CL, ND, TO, WN.

Biology. Lowland (mostly), montane. Collected on *Dysoxylum spectabile*; also in forest remnant, in leaf litter. Seasonality: September, November–April; mostly January. [Phloem-feeder.] Wing condition: Brachypterous to macropterous.

References. Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Subfamily DELPHACINAE

Tribe DELPHACINI

Genus *Anchodelphax* Fennah, 1965 E

Anchodelphax Fennah, 1965: 34. Type species: *Anchodelphax olenus* Fennah, 1965, by original designation.

Geographic distribution. New Zealand.

References. Fennah, 1965 (revision). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification).

Anchodelphax hagnon Fennah, 1965 E

Type photograph p. 183.

Anchodelphax hagnon Fennah, 1965: 36. Holotype male (MONZ); WN, Titahi Bay.

Geographic distribution (Map p. 217). North Island: ND–Paihia (NZAC). WN–Titahi Bay (NZAC; Fennah, 1965). South Island: CO–Rocklands (NZAC).

Biology. [Lowland.] Collected on *Pimelea*, also on tussock and sown clover (*Trifolium*). Seasonality: November–February. [Phloem-feeder.] [Wing condition: Brachypterous.]

References. Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Anchodelphax olenus Fennah, 1965 E

Type photograph p. 183.

Anchodelphax olenus Fennah, 1965: 35. Holotype male (NZAC); WI, Manawatu, Paiaka.

Geographic distribution (Map p. 217). North Island: AK–Auckland (Cornwallis (NZAC); Western Springs (Fennah, 1965)). ND–Poor Knights Islands, Tawhiti Rahi (NZAC). WI–Paiaka (NZAC). WN–Levin, Otaki River (Fennah, 1965). Wellington, Ngahuaranga Gorge [=Ngauranga Gorge] (Fennah, 1965). Offshore Islands: CH–Chatham Island (NZAC), North End Lagoon (NZAC). TH–South West Island (Fennah, 1965).

Biology. Lowland, coastal. Collected on *Muehlenbeckia australis* (in numbers), on *Convolvulus* and *Muehlenbeckia* (several adults and nymphs); also on *Juncus,* other rushes, *Lepidium oleraceum*. [Hostplant: *Muehlenbeckia*.] Seasonality: December–June. [Phloem-feeder.] Wing condition: Brachypterous.

References. Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Genus *Eorissa* Fennah, 1965 E

Eorissa Fennah, 1965: 28. Type species: *Eorissa cicatrifrons* Fennah, 1965, by original designation.

Geographic distribution. New Zealand.

References. Fennah, 1965 (taxonomy). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification).

Eorissa cicatrifrons Fennah, 1965 E

Type photograph p. 183.

Eorissa cicatrifrons Fennah, 1965: 30. Holotype male (NZAC); WN, Levin.

Geographic distribution (Map p. 217). North Island: ND–Paihia (NZAC). Puketi [State] Forest (NZAC). Waipoua [State] Forest (NZAC). WI–Paiaka (NZAC). WN–Levin (NZAC). South Island: CO–Beaumont, 2 km E (NZAC). MC–Banks Peninsula, Price's Valley (NZAC). NN–Nelson, Saxon's Road (NZAC).

Biology. [Lowland.] Collected on rushes and other grasses; also in undergrowth of *Agathis australis* forest (ND). Seasonality: January–April, mostly February. [Phloem-feeder.] Wing condition: Brachypterous (male).

References. Fennah, 1965 (biology, distribution, taxonomy, wing condition). Wise, 1977: 70 (checklist, New Zealand).

Note. This taxon is expected to be more widespread on the North Island than current records suggest.

Genus *Nilaparvata* Distant, 1906 [N]

Nilaparvata Distant, 1906b: 473. Type species: *Nilaparvata greeni* Distant, 1906b, by original designation.

Kalpa Distant, 1906b: 474. Type species: *Kalpa aculeata* Distant, 1906b, by original designation. Synonymised by Muir & Giffard, 1924: 16.

Geographic distribution. Australian Region, Ethiopian Region, Oriental Region, Palaearctic Region.

References. Metcalf, 1943: 294–298 (catalogue, world). Fennah, 1965 (Australia, New Zealand, taxonomy). Wise, 1977: 69 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Nilaparvata myersi Muir, 1923 [E]

Type photograph p. 183.

Nilaparvata myersi Muir, 1923b: 258. Holotype male (MONZ); WN, Tararua Range, Mount Alpha.

Geographic distribution (Map p. 217). North Island: AK, BP, CL, ND, RI, TO, WI, WN, WO. Offshore Islands: TH.

Biology. Lowland (mostly), montane. Mostly collected on *Scirpus* (e.g., *S.* [=*Bolboschoenus*] *fluviatilis*) and *Carex* in swampy areas in open or forested (e.g., *Dacrycarpus dacrydioides*) situations; also recorded among plant roots in silt in coastal bush. Seasonality: November–June. [Phloem-feeder.] Wing condition: Brachypterous (mainly) to macropterous.

References. Metcalf, 1943: 297 (catalogue, world). Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Genus *Notogryps* Fennah, 1965 [E]

Notogryps Fennah, 1965: 26. Type species: *Notogryps melanthus* Fennah, 1965, by original designation.

Geographic distribution. New Zealand.

References. Fennah, 1965 (revision). Wise, 1977: 69 (checklist, New Zealand). Deitz & Helmore, 1979 (identification).

Notogryps ithoma Fennah, 1965 [E]

Type photograph p. 184.

Notogryps ithoma Fennah, 1965: 28. Holotype male (NZAC); ND, Mangonui.

Geographic distribution (Map p. 217). North Island: BP–Maunganui (NZAC). CL–Waikawau (NZAC). ND–Mangonui.

Biology. Lowland (coastal). Collected in *Avicennia* swamp (CL). Seasonality: March. [Phloem-feeder.] Wing condition: Brachypterous.

References. Fennah, 1965 (biology, New Zealand, taxonomy). Wise, 1977: 69 (checklist, New Zealand).

Notogryps melanthus Fennah, 1965 [E]

Type photograph p. 184.

Notogryps melanthus Fennah, 1965: 26. Holotype male (NZAC); WA, Puketoi (Waewaepa [Range]).

Geographic distribution (Map p. 217). North Island: WA–Puketoi (Waewaepa).

Biology. Habitat: Unknown. Seasonality: March. [Phloem-feeder.] Wing condition: Brachypterous.

References. Fennah, 1965 (biology, distribution, taxonomy, wing condition). Wise, 1977: 69 (checklist, New Zealand).

Genus *Notohyus* Fennah, 1965 [E]

Notohyus Fennah, 1965: 22. Type species: *Notohyus erosus* Fennah, 1965, by original designation.

Geographic distribution. New Zealand.

References. Fennah, 1965 (taxonomy). Wise, 1977: 69 (checklist, New Zealand). Deitz & Helmore, 1979 (identification).

Notohyus erosus Fennah, 1965 [E]

Type photograph p. 184.

Notohyus erosus Fennah, 1965: 23. Holotype female (NZAC); MC, Banks Peninsula, Tumbledown Bay.

Geographic distribution (Map p. 217). North Island: AK–Lynfield, Wattle Bay (NZAC). CL–Waikawau (NZAC). WI–Paiaka (NZAC). South Island: MC–Banks Peninsula, Tumbledown Bay.

Biology. Lowland (coastal). Collected in *Scirpus* swamp (AK) and in *Avicennia* swamp (CL). Seasonality: February–April. [Phloem-feeder.] Wing condition: Brachypterous (female).

References. Fennah, 1965 (biology, distribution, taxonomy, wing condition). Wise, 1977: 69 (checklist, New Zealand).

Genus *Opiconsiva* Distant, 1917 [N?]

Opiconsiva Distant, 1917: 301. Type species: *Opiconsiva fuscovaria* Distant, 1917, by original designation.

Corbulo Fennnah, 1965: 48. Type species: *Delphax dilpa* Kirkaldy, 1907a, by original designation. Synonymised by Fennah, 1975b: 112.

Geographic distribution. Australian Region (continental Australia, New Zealand), Ethiopian Region.

References. Metcalf, 1943: 545 (catalogue, world). Fennah,

1965 (Australia, New Zealand, taxonomy; as *Corbulo*). Wise, 1977: 70 (checklist, New Zealand; as *Corbulo*). Deitz & Helmore, 1979 (identification, New Zealand; as *Corbulo*).

Opiconsiva dilpa (Kirkaldy, 1907) N?

Delphax dilpa Kirkaldy, 1907a: 162. Syntypes males* (BPBM); [Australia] New South Wales, Mittagong.
Delphacodes dilpa: Muir, 1917: 333.
Corbulo dilpa: Fennah, 1965: 48.
Opiconsiva dilpa: Asche, 1988: 198.

Geographic distribution (Map p. 217). North Island: AK–Auckland, Lynfield (NZAC). BP–Rotorua, Hannahs Bay (Fennah, 1965). ND–Poor Knights Islands, Tawhiti Rahi (NZAC). Waitangi Estate (Fennah, 1965). RI–Ruahine Range, Armstrong Saddle (NZAC). South Island: MC–Christchurch, near [New] Brighton (NZAC). SL–Hokonui Hills, [Mount] Hedgehope (NZAC). Longwood Range, Orepuki (NZAC). WD–Hokitika (1 km N; 17 km S) (NZAC). Offshore Islands: CH–Chatham Island (Awarakau, near; Awatotara; North End Lagoon) (NZAC). Extralimital range: Australia (continental).

Biology. Lowland to subalpine. Collected in grasslands, alpine meadows, paddocks, salt marshes, and near streams; on *Juncus*, rushes (at night), sedges, exotic grasses. Seasonality: November–March, mostly February. Phloem-feeder. Wing condition: Brachypterous (mainly) to macropterous.

References. Metcalf, 1943: 427 (catalogue, world; as *Delphacodes dilpa*). Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Note. There is one male specimen from Raoul Island (KE) in NZAC, which may belong to this species. The limits between this species and species from other areas, especially from the South Pacific, are however not sufficiently defined in the literature to be certain of this.

Genus *Sardia* Melichar, 1903 N

Sardia Melichar, 1903: 96. Type species: *Sardia rostrata* Melichar, 1903, by monotypy.

Geographic distribution. Australian Region (continental Australia, New Zealand (KE only), Fiji), Oriental Region.

References. Metcalf, 1943: 152–154 (catalogue, world). Fennah, 1965 (Australia, New Zealand, taxonomy). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Note. This genus was not recorded for New Zealand by Fennah (1965).

Sardia rostrata pluto (Kirkaldy, 1906) N

Hadeodelphax pluto Kirkaldy, 1906: 410. Syntypes* sex unknown (BPBM); Queenlands, Cairns.
Sardia pluto: Kirkaldy, 1908: 14.
Sardia rostrata: Muir, 1923a: 257.
Sardia rostrata pluto: Fennah, 1965: 44.

Geographic distribution (Map p. 219). Offshore Islands: KE (NZAC). Extralimital range: Australia (continental), Fiji.

Biology. [Lowland.] Habitat: Unknown. Seasonality: November. Phloem-feeder. Wing condition: Macropterous.

References. Metcalf, 1943: 153–154 (catalogue, world; see *S. pluto* & *S. rostrata*). Fennah, 1965 (Australia, biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Genus *Sulix* Fennah, 1965 E

Sulix Fennah, 1965: 49. Type species: *Sulix vetranio* Fennah, 1965, by original designation.

Geographic distribution. New Zealand.

References. Fennah, 1965 (revision). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification).

Sulix insecutor Fennah, 1965 E

Type photograph p. 184.
Sulix insecutor Fennah, 1965: 51. Holotype male (NZAC); WI, Paiaka (Man.) [=Manawatu].

Geographic distribution (Map p. 218). North Island: WI–Paiaka.

Biology. Habitat: Unknown. Seasonality: January. [Phloem-feeder.] Wing condition: Brachypterous.

References. Fennah, 1965 (biology, distribution, taxonomy, wing condition). Wise, 1977: 70 (checklist, New Zealand).

Sulix miridianalis (Muir, 1917) E

Delphacodes miridianalis Muir, 1917: 334. Holotype* male (BPBM); BP, Rotorua.
Sulix meridianalis [*sic*]: Fennah, 1965: 50.

Geographic distribution (Map p. 218). North Island: AK, BP, ND, TK, TO, WI, WN. South Island: SD–Stephens Island (NZAC). Offshore Islands: TH.

Biology. Lowland (mostly), montane. Collected on and under *Poa anceps*, on various grasses, sedges and rushes, *Scirpus frondosus* [=*Desmoschoenus spiralis*] (in coastal sand dunes), *Lepidium oleraceum* (several adults and tenerals, November, TH), *Carex* and shore vegetation, in

Scirpus swamp; also once on coastal vegetation of mainly *Leptospermum scoparium*. Seasonality: November–February, April, August. [Phloem-feeder.] Wing condition: Forewings submacropterous; hindwings vestigial.

References. Metcalf, 1943: 469 (catalogue, world; as *Delphacodes meridianalis*). Fennah, 1965 (biology, distribution, taxonomy; as *Sulix meridianalis*). Wise, 1977: 70 (checklist, New Zealand; as *Sulix meridianalis*).

Notes. NZAC has specimens from WD and SL with uncertain determinations, pending further taxonomic work on New Zealand delphacids. The original spelling by Muir (1917: 334) for the description of the new species is "*miridianalis*", but Muir (1917: 312) used "*meridianalis*" in the caption for figure 24 in plate V. Fennah (1965) used the latter spelling without comment.

Sulix tasmani (Muir, 1923) [E]

Type photograph p. 185.

Delphacodes tasmani Muir, 1923b: 258. Holotype male (MONZ); WN, Waikanae.

Sulix tasmani: Fennah, 1965: 52.

Geographic distribution (Map p. 218). North Island: AK, BP, CL, ND, WI, WN.

Biology. Lowland (mostly), montane. Collected on grasses, sedges, vegetation at bush margin, and small-leaved *Muehlenbeckia*; also in a paddock and once on *Pseudopanax*. Seasonality: November–February, July. [Phloem-feeder.] Wing condition: Forewings submacropterous; hindwings vestigial.

References. Metcalf, 1943: 519 (catalogue, world; as *Delphacodes tasmani*). Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Note. NZAC has specimens from TO, RI (North Island) and SD, NN, WD, DN (South Island) with uncertain determinations, pending further taxonomic work on New Zealand delphacids.

Sulix vetranio Fennah, 1965 [E]

Type photograph p. 185.

Sulix vetranio Fennah, 1965: 53. Holotype male (MONZ); WI, Foxton.

Geographic distribution (Map p. 218). North Island: WI–Foxton (MONZ, NZAC). WN–Lyall Bay (NZAC).

Biology. Lowland, coastal. Collected on *Scirpus frondosus* [=*Desmoschoenus spiralis*] in coastal sand dunes. Seasonality: January. [Phloem-feeder.] [Wing condition: Brachypterous.]

References. Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Genus *Toya* Distant, 1906 [A]

Toya Distant, 1906b: 472. Type species: *Toya attenuata* Distant, 1906b, by original designation.

Geographic distribution. Worldwide; New Zealand (adventive).

References. Metcalf, 1943: 388–389 (catalogue, world). Fennah, 1965 (Australia, New Zealand, taxonomy). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Toya dryope (Kirkaldy, 1907) [A]

Delphax dryope Kirkaldy, 1907a: 154. Syntypes* (males, females) (BPBM); [Australia] Queensland, Cairns; Queensland, Redlynch; Queensland, Kuranda; Fiji, Rewa.

Delphacodes dryope: Muir, 1917: 333.

Toya dryope: Fennah, 1965: 56.

Geographic distribution (Map p. 218). North Island: GB–Gisborne (NZAC). HB–Napier estuary. ND–Paihia (NZAC). Waitangi Estate (Fennah, 1965). WA–Waewaepa Range (NZAC). First New Zealand record: ND, Waitangi Estate, 1951 (Fennah, 1965). Extralimital range: American Samoa, Australia (continental), Fiji, Samoa.

Biology. Lowland, coastal (mostly). Collected from a grape harvester (in large numbers, GB), in a paddock, and on grass in general. Seasonality: September, November, February–March. Phloem-feeder. Wing condition: Brachypterous to macropterous.

References. Metcalf, 1943: 433 (catalogue, world; as *Delphacodes dryope*). Fennah, 1965 (biology, distribution, taxonomy). Wise, 1977: 70 (checklist, New Zealand).

Note. NZAC has specimens from AK (North Island), MC, OL, CO, FD (South Island) and KE (Kermadec Islands) with uncertain determinations, pending further taxonomic work on New Zealand delphacids.

Family DERBIDAE

Derbid planthoppers

References. Muir, 1927 (revision, Samoa). Metcalf, 1945 (catalogue, world), 1946a (Guam, revision). Fennah, 1950b (Fiji, revision), 1956 (Micronesia, revision), 1969 (New Caledonia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Fletcher & Carver, 1991 (Australia, overview; under Fulgoroidea). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2003 (Australia, checklist; updated 2006). Larivière, 2005 (checklist, New Zealand).

Subfamily CEDUSINAE

Tribe CEDUSINI

Genus *Eocenchrea* Muir, 1913 N

Eocenchrea Muir, 1913: 36. Type species: *Cenchrea maorica* Kirkaldy, 1909b, by original designation.

Gonyphlepsia Jacobi, 1928: 39. Type species: *Gonyphlepsia montistympani* Jacobi, 1928, by original designation. Synonymised by Muir, 1934: 565.

Geographic distribution. Australia (continental), New Caledonia, New Zealand.

References. Metcalf, 1945: 119–120 (catalogue, world). Wise, 1977: 71 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Eocenchrea maorica (Kirkaldy, 1909) E

Cenchrea maorica Kirkaldy, 1909b: 80. Holotype* female; New Zealand (BPBM).

Eocenchrea maorica: Muir, 1913: 37.

Geographic distribution (Map p. 219). North Island: AK, BP, CL, HB, ND, WA, WI, WN, WO.

Biology. Lowland, montane. Collected on undergrowth in *Agathis australis* forest, in shrublands-podocarp forest, under logs (adults); on *Astelia banksii* (tenerals). Seasonality: October–April. [Possibly fungivore (nymph); phloem-feeder (adult).] Wing condition: Macropterous.

References. Metcalf, 1945: 120 (catalogue, world). Wise, 1977: 71 (checklist, New Zealand).

Family DICTYOPHARIDAE

Dictyopharid planthoppers

References. Metcalf, 1946b (catalogue, world). Fennah, 1956 (Micronesia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Fletcher & Carver, 1991 (Australia, overview; under Fulgoroidea). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2003 (Australia, checklist; updated 2006). Larivière, 2005 (checklist, New Zealand).

Subfamily DICTYOPHARINAE

Tribe DICTYOPHARINI

Genus *Thanatodictya* Kirkaldy, 1906 N

Subgenus *Niculda* Kirkaldy, 1906 N

Niculda Kirkaldy, 1906: 392 (as subgenus of *Thanatodictya*). Type species: *Thanatodictya* (*Niculda*) *anadyomene* Kirkaldy, 1906, by original designation.

Geographic distribution. Australian Region (Australia, New Zealand), Oriental Region.

References. Metcalf, 1946b: 82–86 (catalogue, world). Wise, 1977: 71 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Thanatodictya (*Niculda*) *tillyardi* Myers, 1923 E

Type photograph p. 186.

Thanatodictya [*Niculda*] *tillyardi* Myers, 1923a: 428. Holotype male (NZAC); NN, Dun Mountain.

Common name: Longheaded Bracken Hopper.

Geographic distribution (Map p. 219). North Island: AK, BP, CL, HB, ND, TO, WN. South Island: BR, CO, KA, MB, MK, NN, OL, SD.

Biology. Mostly lowland (often coastal), montane. Collected on ferns and grass (several adults and tenerals); on bracken fern (*Pteridium esculentum*), fern-*Kunzea-Coprosma* associations, coastal *Ozothamnus,* general beach vegetation (including coastal dune grass), *Muehlenbeckia-Olearia-Coprosma* associations, *Phormium tenax*, sedge-*Paspalum* association; also on a tree fern trunk, and once on *Podocarpus nivalis* (at high altitude). [Hostplant: Ferns.] Seasonality: November–December, January–March (mostly), April. [Phloem-feeder.] Wing condition: Submacropterous to macropterous.

References. Metcalf, 1946b: 85–86 (catalogue, world). Wise, 1977: 71 (checklist, New Zealand). Deitz & Helmore, 1979 (biology).

Note. Although Myers (1923a) did not use the full combination *Thanatodictya* (*Niculda*) *tillyardi*, he indicated in the generic description that the vertex and stigma are characteristic of the subgenus *Niculda* Kirkaldy.

Family FLATIDAE

Flatid planthoppers

References. Zimmerman, 1948 (Hawaii, revision). Fennah, 1950b (Fiji, revision), 1956 (Micronesia, revision). Metcalf, 1957 (catalogue, world). Fennah,1969 (New Caledonia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Medler, 1987 (Bishop Museum, types). Fletcher, 1988 (genera, Australia, review). Medler, 1989 (crop survey, New Guinea). Fletcher & Carver, 1991 (Australia, overview; under Fulgoroidea). Medler, 1999 (Indonesia, revision). Fletcher

& Larivière, 2001 (Australia, New Zealand; checklist, identification). Medler, 2001a (New Guinea and vicinity, taxonomy), 2001b (revision, Southern Africa). Fletcher & Watson, 2003 (Australia, checklist; updated 2006). Larivière, 2005 (checklist, New Zealand).

Subfamily FLATINAE

Tribe FLATINI

Genus *Anzora* Medler, 1986 [A]

Anzora Medler, 1986a: 206. Type species: *Massila unicolor* Walker, 1862, by original designation.

Geographic distribution. Australia (continental, Tasmania); New Zealand (adventive).

References. Wise, 1977: 71 (checklist, New Zealand; as *Sephena*). Deitz & Helmore, 1979 (identification, New Zealand; as *Sephena*). Fletcher, 1988 (Australia, taxonomy).

Anzora unicolor (Walker, 1862) [A]

Massila unicolor Walker, 1862: 315. Holotype* male (F.P. Pascoe Collection); [Australia] Queensland, Moreton Bay.

Sephena cinerea Kirkaldy, 1906: 457. Holotype* male (BPBM); Australia, New South Wales, Sydney. Synonymised by Medler, 1986a: 206.

Anzora unicolor: Medler, 1986a: 206.

Common name: Grey Planthopper.

Geographic distribution (Map p. 219). North Island: AK, BP, CL, GB, HB, ND, TO, WA, WI, WN, WO. South Island: MB, MC, NN. First New Zealand record: AK–'Auckland Province' (Myers, 1923a). Extralimital range: Australia (continental, Tasmania).

Biology. Mostly lowland (often coastal), montane. Collected on *Acacia armata* [=*A. paradoxa*], beach vegetation, *Berberis,* citrus foliage, *Cytisus*, in coastal scrub, on *Coriaria arborea*, in garden, on *Geniostoma*, grass, under bracken fern (*Pteridium esculentum*), on *Hebe stricta*, *Hoheria* flowers, *Lotus major*, *Magnolia*, in *Avicennia* swamp, on moss in forest, on *Muehlenbeckia*, *Muehlenbeckia-Olearia-Coprosma* associations, *Myoporum laetum*; in orchard with *Leptospermum*, on *Phormium tenax*, *Pteridium aquilinum* [=*P. esculentum*], rushes in tidal flat, tidewater monocots, and *Zea mays*. Seasonality: October, December, January–March (mostly), April–June. Phloem-feeder. Wing condition: Macropterous. Economic importance: Reported as a vector of fireblight, *Erwinia amylovora*, on apple and pear trees.

References. Myers, 1923a (economic importance; as *Sephena cinerea*). Metcalf, 1957: 367 (catalogue, world; as *Sephena cinerea*). Wise, 1977: 71 (checklist, New Zealand; as *Sephena cinerea*).

Tribe SIPHANTINI

Genus *Siphanta* Stål, 1862 [A]

Siphanta Stål, 1862c: 69. Type species: *Poeciloptera acuta* Walker, 1851a, designated by Melichar, 1902: 36.

Phalainesthes Kirkaldy, 1899: 359. Type species: *Phalainesthes schauinslandi* Kirkaldy, 1899, by original designation. Synonymised by Kirkaldy, 1902: 117.

Siphantoides Distant, 1910a: 305. Type species: *Siphantoides conspicua* Distant, 1910a, by original designation. Synonymised by Fletcher, 1985: 3.

Parasalurnis Distant, 1910a: 309. Type species: *Poeciloptera roseicincta* Walker, 1862, by original designation. Synonymised by Fletcher, 1985: 3.

Lombokia Distant, 1910b: 323. Type species: *Lombokia everetti* Distant, 1910b, by monotypy. Synonymised by Fletcher, 1985: 3.

Geographic distribution. Australian Region (continental Australia, Tasmania, Papua New Guinea, Torres Strait Islands), California (adventive), Hawaii (adventive), Indonesia, South Africa (adventive); New Zealand (adventive).

References. Metcalf, 1957: 231–240 (catalogue, world). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Fletcher, 1985 (revision), 1988, 2002 (Australia, taxonomy).

Siphanta acuta (Walker, 1851) [A]

Poeciloptera acuta Walker, 1851a: 448. Syntypes* sex undetermined (BMNH); "New Holland" [= Australia].

Poeciloptera cupido Walker, 1851a: 453. Holotype* male (BMNH); type locality unknown. Synonymised by Stål, 1862a: 489.

Siphanta acuta: Stål, 1862c: 69.

Cromna elegans Costa, 1864: 149. Type status and repository unknown; "Habitat in Australia?" (Costa, 1864). Synonymised by Melichar, 1902: 36.

Phalainesthes schauinslandi Kirkaldy, 1899: 359. Holotype* female (UMB); Hawaii, Hilo. Synonymised by Kirkaldy, 1902: 117.

Common names: Green Planthopper (Australia, New Zealand), Torpedo Bug (Hawaii).

Geographic distribution (Map p. 219). North Island: AK, BP, CL, GB, HB, ND, TK, WA, WI, WN, WO. South Island: BR, CO, MC, NN, WD. First New Zealand record: AK–Auckland (Kirkaldy, 1909a). Extralimital range: Australia (continental, Tasmania), California (adventive), Hawaii (adventive), South Africa (adventive).

Biology. Mostly lowland (often coastal), montane. Collected in broadleaf and mixed forests (e.g., *Beilschmiedia tarairi* forest, *Vitex lucens-Rhopalostylis sapida* forest), in more open environments, including coastal and montane habitats, as well as in gardens; on a wide range of native and

introduced plants (e.g., *Clianthus, Coprosma-Myrsine* associations, *Coprosma repens, Coriaria*, *Citrus limon, Dahlia*, *Gardenia*, *Helianthus, Leptospermum scoparium*, *Metrosideros* (including *M. excelsa*), moss from rocks (at high altitude), *Muehlenbeckia-Olearia-Coprosma* associations, *Musa*, *Pittosporum eugenioides*, *Podocarpus totara*, *Rubus idaeus, R. ursinus, Salicornia*-weeds-grasses (at night), *Solanum aviculare*, *Spiraea japonica, S. ulmaria,* tidewater monocots (adults)); also found on *Tabebuia* (adults, nymphs) and on *Cornus capitata* (eggs). Hostplants: *Coprosma*, citrus trees, various ornamental shrubs (New Zealand); a wide range of native and exotic plants (Australia). Seasonality: all months of the year, mostly December–April. Phloem-feeder. Wing condition: Macropterous.

References. Myers, 1922b (biology, taxonomy, New Zealand). Metcalf, 1957: 233–236 (catalogue, world). Wise, 1977: 71 (checklist, New Zealand). Fletcher, 1979a (Australia, biology).

Family RICANIIDAE

Ricaniid planthoppers

References. Muir, 1927 (revision, Samoa). Fennah, 1950b (Fiji, revision). Metcalf, 1955b (catalogue, world). Fennah, 1956 (Micronesia, revision). Wise, 1977 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand). Fletcher & Carver, 1991 (Australia, overview; under Fulgoroidea). Fletcher & Larivière, 2001 (Australia, New Zealand; checklist, identification). Fletcher & Watson, 2003 (Australia, catalogue; updated 2006). Larivière, 2005 (checklist, New Zealand).

Genus *Scolypopa* Stål, 1859 [A]

Scolypopa Stål, 1859b: 325. Type species: *Pochazia australis* Walker, 1851a, designated by Jacobi, 1916: 306.

Dechitus Walker, 1862: 311. Type species: *Dechitus aphrophoroides* Walker, 1862, designated by Metcalf, 1955b: 165. Synonymised by Metcalf, 1955b: 165.

Geographic distribution. Australia (continental, Tasmania, Lord Howe Island, Norfolk Island), New Caledonia, Oriental Region; New Zealand (adventive).

References. Metcalf, 1955b: 165–170 (catalogue, world). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (identification, New Zealand).

Scolypopa australis (Walker, 1851) [A]

Pochazia australis Walker, 1851a: 430. Syntypes* sex undetermined (BMNH); "New Holland" [=Australia].

Flatoides australis Walker, 1858a: 102. Syntypes* sex undetermined (BMNH); [Australia] Queensland. Synonymised by Melichar 1898: 278.

Scolypopa urbana Stål, 1859b: 325. Syntypes* sex undetermined (NHRM); [Australia] New South Wales. Synonymised by Melichar 1898: 278.

Ricania australis: Distant, 1878: 39.

Scolypopa australis: Melichar, 1898: 278.

Common name: Passionvine Hopper.

Geographic distribution (Map p. 221). North Island: AK, BP, CL, GB, HB, ND, RI, TK, WI, WN, WO. South Island: MB, NN. Stewart Island: Mount Rakeahua (NZAC). First New Zealand record: New Zealand (Distant, 1878). Extralimital range: Australia (continental, Tasmania, Lord Howe Island, Norfolk Island).

Biology. Lowland, mostly coastal. Lives on a wide variety of native and exotic plants in a wide range of habitats, including urban gardens, shrublands, and forest areas. Seasonality: Throughout most of the year, especially February–March. Phloem-feeder. Wing condition: Macropterous. Economic importance: Pest of passion vines and kiwifruit vines on which it builds up into huge populations causing heavy deposits of 'honeydew' leading to the growth of sooty moulds which impairs the marketability of the fruit; also attacks a variety of native plants; occasionally involved in the production of poisonous honey which may occur if bees collect honeydew excreted by *Scolypopa australis* feeding on the endemic tree *Coriaria arborea*.

References. Palmer-Jones *et al*., 1947 (biology, economic importance, New Zealand). Metcalf, 1955b: 167–169 (catalogue, world). Cumber, 1966, 1967 (biology, economic importance, New Zealand). Wise, 1977: 70 (checklist, New Zealand). Deitz & Helmore, 1979 (biology, New Zealand). Fletcher, 1979b (morphology). Hill & Steven, 1989 (biology, economic importance, New Zealand).

Notes. This taxon has generally been assumed to be a native of Australia, from where it could have been introduced more than once as eggs on plant materials. Records of this species from Fiji are most probably wrong (Fennah, 1950b).

The outlying distribution record from Stewart Island is based on a single NZAC specimen from a bulk litter sample ("68/51 Mt. Rakeahua, Stewart Id. 2000' 14.ii.68. G. Kuschel. Unsifted dead leaves of *Olearia colensoi* from sheltered side of rocks") which would have been processed in Nelson, and may be the result of cross sample contamination (T. K. Crosby, personal communication).

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Appendix A. Glossary

adventive — not native; an organism not originating or not naturally occurring in a geographically defined area in which it is found.

alpine — of or pertaining to land located above the subalpine zone, characterised by grasslands, herb fields and screes, and reaching up to the summer snow line.

altitudinal distribution — distribution related to altitude, i.e., lowland, montane, subalpine, alpine.

arboreal — living on trees and shrubs.

biostatus — the status of an organism based on its geographic origin relative to its occurrence in a particular region, e.g., endemic, native (or indigenous), adventive.

brachypterous — having forewings reaching one-third to two-thirds of abdomen length, the appendix (apical membrane) absent or reduced, and the hindwings as long as or substantially shorter than the forewings.

coastal — of or pertaining to the strip of land within the influence of the sea.

endemic — restricted to a geographic area.

epigean — living on the surface of the ground.

extralimital range — distribution of an organism outside the limits of a specific geographic area (e.g., outside New Zealand).

family — a category in the taxonomic hierarchy, that includes one or more genera or tribes of common phylogenetic origin, separated from other such groups by a decided evolutionary gap.

family-group — any category in the taxonomic hierarchy from family to tribe, including intermediate categories (e.g., family, subfamily, tribe).

fungivore (mycetophagous) — feeding on fungi.

genus — a category in the taxonomic hierarchy, that includes one or more phylogenetically related and, usually, morphologically similar species.

genus-group — the category of genus or subgenus in the taxonomic hierarchy.

geographic distribution — distribution related to geography, i.e., districts, regions.

gumland — shrub-covered, flat to rolling land in northernmost New Zealand, with deposits of kauri (*Agathis australis*) gum.

holotype or **type** — the single specimen designated or indicated as the type specimen of a species by the original author at the time of publication or the only specimen on which the original description was based.

hostplant — the plant on which a living organism breeds, develops and feeds.

indigenous — see native.

lectotype — type specimen selected from the syntypes by a subsequent author in the absence of a holotype.

lowland — of or pertaining to land located below the montane zone and generally reaching up to the limit of rimu (*Dacrydium cupressinum*), e.g., about 500 m in central New Zealand.

macropterous — having both pairs of wings of approximately equal length, more or less reaching apex of abdomen.

mesophyll — parenchyma that makes up most of the interior of a plant leaf between its upper and lower outer layers.

micropterous — displaying an extreme form of brachyptery, with vestigial hindwings (reduced to small pads or membranous lobes).

monotypy — the situation when a nominal genus or subgenus is established on the basis of a single species (the type species by monotypy) also the situation when a holotype exists through recognition that the original author based a species on a single specimen.

montane — of or pertaining to land located above the lowland zone and reaching up to the tree line.

native — an organism originating or naturally occurring in a geographically defined area in which it is found.

neotype — a newly designated name-bearing type specimen when the original type or holotype is lost or destroyed.

new name — a new name proposed to replace an earlier preoccupied name; replacement name.

original designation — the situation when the type of a taxon (genus, subgenus or species) is designated at the same time as the taxon is established (the type species, or holotype, by original designation).

parenchyma — the functional living tissue that makes up the bulk of most non-woody structures in plants.

phloem — one of two primary components of vascular tissue of plants, the other being xylem; the principal food-, predominantly sucrose-, conducting tissue.

phytophagous — feeding on plant material.

planticolous — living on plants other than trees or shrubs.

preoccupied name — a name already in use for another taxon based on a different type specimen.

replacement name — see new name.

scree — accumulation of loose stones on a slope.

scrub — vegetation consisting of stunted trees, bushes, and other plants.

scrubland — vegetation unit with dense cover less than 2 metres tall; area or land covered with scrub vegetation.

seasonality — period of the year when an animal is active.

sensu lato (Latin) — in the broad sense.

sensu stricto (Latin) — in the strict or narrow sense.

shrubland — vegetation unit with sparse or moderate cover and often taller than 2 metres.

species — a taxon of the rank of species, the category below the genus in the taxonomic hierarchy; naturally occurring populations with a common heredity; groups of actually or potentially interbreeding populations which are reproductively isolated from other such groups.

species-group — the category of species or subspecies in the taxonomic hierarchy.

subalpine — of or pertaining to land located above the tree line and characterised by a mountain shrubland (e.g., of *Olearia, Brachyglottis,* and *Dracophyllum*).

submacropterous — having the hindwings visibly shorter than the forewings, and the forewings less developed than those of true macropterous individuals, reaching more than two-thirds of abdomen length.

subnival — of or pertaining to land within the immediate influence of summer snowline/ persistent snow/ice-fields.

subspecies — a taxon of the rank of subspecies; group of naturally interbreeding populations that differs morphologically and is often isolated from other such groups, but can still interbreed with these groups in the zone of geographic overlap.

synonym — one of two or more scientific names applied to a taxon.

syntype — any of two or more specimens on which the original description of a taxon was based when a holotype was not designated.

Taupo Line — a line across the North Island at the level of Lake Taupo (about 39ºS), dividing the island into upper and lower biogeographic regions (see Gibbs, 2006).

taxon (plural, **taxa**) — a taxonomic grouping of any rank (e.g., a family, a genus, a species) including all its subordinate groups.

teneral — a new or young adult, recently emerged, sexually mature, with softer or paler exoskeleton.

type or **name-bearing type** — the specimen(s), species or genus that serves as the objective standard of reference determining the application of a name to a taxon.

type locality — the precise geographical site where the type of a species or subspecies was collected.

type species — the species designated as the type of a genus or subgenus.

type specimen — a specimen (e.g., holotype, lectotype, neotype) or one of a series of specimens (syntypes) designated as the type of a species or subspecies.

valid name — the name for a particular taxon, that is correct according to the provisions of the International Code of Zoological Nomenclature.

xylem — one of two primary components of vascular tissue of plants, the other being phloem; the principal water-conducting tissue.

Appendix B. Plants associated with Auchenorrhyncha in New Zealand.

Previous *Cassinia* records (except *C. aculeata*) are now referred to under *Ozothamnus leptophyllus*. * = Exotic plants; # = Genus may include exotic, cultivated exotic or native species; [] = Plants absent from New Zealand; — = No information.

Scientific name	Common name	Family name
**Acacia*	acacia, wattle	Mimosaceae
**Acacia armata*	kangaroo acacia	Mimosaceae
= *A. paradoxa*		
**Acacia decurrens*	early black/green wattle	Mimosaceae
Acaena novae-zelandiae	red bidibid	Rosaceae
Aciphylla	speargrass, karamea	Apiaceae
Aciphylla aurea	golden speargrass	Apiaceae
Aciphylla colensoi	giant speargrass, taramea	Apiaceae
**Actinidia deliciosa*	kiwifruit	Actinidiaceae
**Aesculus hippocastanum*	horse chestnut	Hippocastanaceae
Agathis australis	kauri	Araucariaceae
**Agave*	agave	Agavaceae
**Ageratum*	—	Asteraceae
**Ageratum conyzoides*	billygoat-weed, chickweed	Asteraceae
**Agrostis tenuis*	—	Poaceae
**Alcea*	hollyhock	Malvaceae
**Alcea rosea*	hollyhock	Malvaceae
**Alnus*	alder	Betulaceae
**Alnus glutinosa*	European alder	Betulaceae
Apodasmia similis	jointed wire rush, oioi	Restionaceae
**Arctotis stoechadifolia*	blue-eyed African daisy	Asteraceae
Aristotelia fruticosa	mountain wineberry	Elaeocarpaceae
Ascarina lucida	hutu	Chloranthaceae
Astelia	mauri	Liliaceae
Astelia banksii	horahora, coastal astelia	Liliaceae
Avicennia	mangrove, manawa	Verbenaceae
Beilschmiedia tarairi	taraire	Lauraceae
**Berberis*	barberry	Berberidaceae
**Betula*	birch	Betulaceae
**Betula alba*	white birch	Betulaceae
Blechnum	kiokio, hard fern	Blechnaceae
Blechnum capense	—	Blechnaceae
Blechnum penna-marina	alpine hard/water fern	Blechnaceae
Brachyglottis buchananii	—	Asteraceae
Brachyglottis cassinioides	—	Asteraceae
Brachyglottis elaeagnifolius	—	Asteraceae
Brachyglottis huntii	rautini	Asteraceae
**Brassica rapa*	turnip	Brassicaceae
**Cajanus*	pigeonpea	Fabaceae
Calystegia soldanella	shore bindweed, panahi	Convolvulaceae
#Carex	sedge, makura	Cyperaceae
Carmichaelia	neinei	Fabaceae
Carpodetus serratus	putaputaweta	Grossulariaceae
Cassinia	—	Asteraceae
Cassinia leptophylla		
= *Ozothamnus leptophyllus*	cottonwood, tauhinu	Asteraceae
Cassinia retorta	—	Asteraceae
= *O. leptophyllus*		

Cassinia vauvilliersii = *O. leptophyllus*	—	Asteraceae
**Casuarina*	she-oak	Casuarinaceae
Celmisia	—	Asteraceae
Celmisia discolor	—	Asteraceae
Celmisia lyallii	false Spaniard	Asteraceae
Celmisia ramulosa	—	Asteraceae
Celmisia sessiliflora	white cushion mountain daisy	Asteraceae
Celmisia viscosa	snow mountain daisy	Asteraceae
Chionochloa	snow grass, snow tussock	Poaceae
Chionochloa australis	carpet grass, haumata	Poaceae
Chionochloa rubra	red tussock	Poaceae
**Chrysanthemoides monilifera*	boneseed	Asteraceae
**Cirsium arvense*	Californian thistle	Asteraceae
**Citrus aurantifolia*	lime	Rutaceae
**Citrus limon*	lemon	Rutaceae
Clianthus	glory pea, kaka beak	Fabaceae
Collospermum	—	Liliaceae
#*Convolvulus*	—	Convolvulaceae
Coprosma	coprosma	Rubiaceae
Coprosma chathamica	—	Rubiaceae
Coprosma lucida	kakaramu, shining karamu	Rubiaceae
Coprosma macrocarpa	kakaramu, large seeded coprosma	Rubiaceae
Coprosma parviflora	leafy coprosma	Rubiaceae
Coprosma propinqua	miki, mingimingi	Rubiaceae
Coprosma repens	angiangi	Rubiaceae
Coprosma rhamnoides	—	Rubiaceae
Coprosma robusta	kakaramu, glossy karamu	Rubiaceae
Coriaria	tupakihi, tutu	Coriariaceae
Coriaria arborea	pohou, tree tutu	Coriariaceae
**Cornus capitata*	Himalayan strawberry tree	Cornaceae
Corokia	corokia	Cornaceae
#*Cortaderia*	pampas grass, toetoe	Poaceae
Cortaderia fulvida	toetoe	Poaceae
Corynocarpus	karaka nut, karaka	Corynocarpaceae
**Cotoneaster*	cotoneaster, rockspray	Rosaceae
Cotula	bachelor's buttons	Asteracea
**Crataegus*	hawthorn	Rosaceae
Cyathea	—	Cyatheaceae
Cyathodes = *Leucopogon/Leptecophylla*	—	Epacridaceae
Cyathodes fasciculata = *Leucopogon fasciculatus*	tall mingimingi	Epacridaceae
Cyathodes juniperina = *Leptecophylla juniperina*	mingimingi	Epacridaceae
**Cynodon*	—	Poaceae
**Cynodon dactylon*	Indian doab	Poaceae
[*Cyperus ferax*]	—	Cyperaceae
**Cytisus*	broom	Fabaceae
Dacrycarpus dacrydioides	white pine, kahikatea	Podocarpaceae
Dacrydium	—	Podocarpaceae
Dacrydium cupressinum	rimu	Podocarpaceae

**Dactylis glomerata*	cocksfoot	Poaceae
**Dahlia*	dahlia	Asteraceae
**Daucus carota*	carrot and wild carrot	Apiaceae
**Digitaria henryi*	—	Poaceae
**Digitaria sanguinalis*	summer grass	Poaceae
Discaria	—	Rhamnaceae
Discaria toumatou	matagouri	Rhamnaceae
Dolichoglottis lyallii	—	Asteraceae
Dracophyllum	neinei, grass tree	Epacridaceae
Dracophyllum longifolium	inaka, inanga	Epacridaceae
Dracophyllum subulatum	monoao	Epacridaceae
Dracophyllum traversii	neinei, large/mountain neinei	Epacridaceae
Drapetes = *Kelleria*	—	Thymelaeaceae
Dryopteris pennigera = *Pneumatopteris pennigera*	feather fern, pakau	Dryopteridaceae
Dysoxylum spectabile	koekohe	Meliaceae
[*Ehrharta longiflora*]	annual veldtgrass	Poaceae
Elatostema rugosum	parataniwha	Urticaceae
Empodisma minus	wire rush	Restionaceae
Entelea	—	Tiliaceae
#Epilobium	willowherb	Onagraceae
**Erigeron*	fleabane	Asteraceae
[*Eriochloa subglabra*]	aleman grass	Poaceae
**Escallonia*	escallonia	Grossulariaceae
**Eucalyptus*	eucalypt, gum tree	Myrtaceae
**Fragaria x ananassa*	strawberry	Rosaceae
#Fuchsia	fuchsia	Onagraceae
**Gardenia*	—	Rubiaceae
Gaultheria	snowberry, koropuka	Ericaceae
Geniostoma	—	Loganiaceae
#Geranium	cranesbill, geranium	Geraniaceae
Griselinia	—	Cornaceae
Halocarpus biformis	pink pine, yellow pine	Podocarpaceae
Halocarpus kirkii	manoao	Podocarpaceae
Hebe	hebe, koromiko	Scrophulariaceae
Hebe bollonsii	—	Scrophulariaceae
Hebe divaricata	—	Scrophulariaceae
Hebe elliptica	shore hebe, kokomuka	Scrophulariaceae
Hebe odora	—	Scrophulariaceae
Hebe parviflora	koromiko taranga	Scrophulariaceae
Hebe rakaiensis	—	Scrophulariaceae
Hebe salicifolia	koromiko	Scrophulariaceae
Hebe stricta	koromiko	Scrophulariaceae
Hebe subalpina	—	Scrophulariaceae
**Helianthus*	sunflower	Asteraceae
Helichrysum bellidioides = *Anaphalioides bellidioides*	hells bells	Asteraceae
**Hieracium*	hawkweed	Asteraceae
**Hieracium caespitosum*	field hawkweed	Asteraceae
**Hieracium lepidulum*	tussock hawkweed	Asteraceae
**Hieracium pilosella*	mouse-ear hawkweed	Asteraceae
**Hieracium praealtum*	king devil	Asteraceae

Hoheria	ribbonwood, houhere	Malvaceae
Hoheria glabrata	houhere	Malvaceae
Imperata	—	Poaceae
**Ipomoea batatas*	sweet potato, yam	Convolvulaceae
#*Juncus*	rush, kopungawha	Juncaceae
Knightia excelsa	rewarewa	Proteaceae
Kunzea ericoides	kanuka	Myrtaceae
**Kyllingia* =*Cyperus kyllingia*	kyllingia	Cyperaceae
**Lathyrus latifolius*	everlasting pea	Fabaceae
**Lavandula*	lavender	Lamiaceae
Lepidium oleraceum	cook's scurvy grass, heketara	Brassicaceae
**Leptocarpus* (NZ records) = *Apodasmia*	—	Restionaceae
Leptocarpus similis = *Apodasmia similis*	jointed wire rush, oioi	Restionaceae
**Leptocarpus simplex* (NZ records) = *Apodasmia similis*	—	Restionaceae
#*Leptospermum*	tea tree	Myrtaceae
Leptospermum scoparium	tea tree, manuka	Myrtaceae
**Lotus major*	birdsfoot trefoil	Fabaceae
Macropiper excelsum	pepper tree, kawakawa	Piperaceae
**Magnolia*	magnolia	Magnoliaceae
**Malus*	apple	Rosaceae
Mariscus = *Cyperus*	—	Cyperaceae
**Marrubium vulgare*	horehound	Lamiaceae
**Medicago sativa*	lucerne, alfalfa	Fabaceae
Melicytus	mahoe	Violaceae
Melicytus chathamicus	Chatham Island mahoe	Violaceae
Melicytus ramiflorus	mahoe	Violaceae
**Melissa officinalis*	lemon balm	Lamiaceae
**Mentha*	mint	Lamiaceae
Meryta	—	Araliaceae
Meryta sinclairii	puka, pukanui	Araliaceae
#*Metrosideros*	rata	Myrtaceae
Metrosideros excelsa	pohutukawa	Myrtaceae
Metrosideros kermadecensis	Kermadec pohutukawa	Myrtaceae
Metrosideros perforata	clinging rata, aka	Myrtaceae
Muehlenbeckia	pohuehue	Polygonaceae
Muehlenbeckia australis	pohuehue	Polygonaceae
**Musa*	banana	Musaceae
#*Myoporum*	—	Myoporaceae
Myoporum laetum	ngaio	Myoporaceae
Myrsine	mapou	Myrsinaceae
**Nepeta faassenii*	cat-mint	Lamiaceae
**Nicotiana tabacum*	tobacco	Solanaceae
#*Nothofagus*	southern beech, tawai	Nothofagaceae
Nothofagus fusca var. *colensoi* = *N. truncata*	—	Nothofagaceae

Nothofagus fusca	hutu, red beech	Nothofagaceae
Nothofagus menziesii	tawhai, silver beech	Nothofagaceae
Nothofagus solandri	tawhai rauriki, black beech	Nothofagaceae
Nothofagus solandri var. *cliffortioides*	tawhai rauriki, mountain beech	Nothofagaceae
Olearia	tree daisy, akeake	Asteraceae
Olearia arborescens	tree daisy	Asteraceae
Olearia avicenniifolia	akeake	Asteraceae
Olearia colensoi	tupare	Asteraceae
Olearia ilicifolia	hakeke	Asteraceae
Olearia lacunosa	lancewood tree daisy	Asteraceae
Olearia moschata	musky tree daisy	Asteraceae
Olearia solandri	coastal tree daisy	Asteraceae
Olearia virgata	twiggy tree daisy	Asteraceae
**Oryza*	rice	Poaceae
**Oryza sativa*	rice	Poaceae
**Oxalis debilis*	pink shamrock	Oxalidaceae
Ozothamnus	—	Asteraceae
Ozothamnus leptophyllus	cottonwood, tauhinu	Asteraceae
[*Panicum barbinode*]	paragrass	Poaceae
**Paspalum*	—	Poaceae
**Pennisetum*	—	Poaceae
**Pennisetum clandestinum*	kikuyu grass	Poaceae
Phormium	flax, NZ flax	Agavaceae
Phormium tenax	flax, harakeke	Agavaceae
Phyllocladus alpinus	mountain celery pine, toatoa	Phyllocladaceae
Pimelea	rice flower	Thymelaceaceae
Pittosporum	pittosporum, kohukohu	Pittosporaceae
Pittosporum eugenioides	tarata	Pittosporaceae
Plagianthus	—	Malvaceae
Plagianthus betulinus = *P. regius*	lowland ribbonwood, houi	Malvaceae
Plagianthus divaricatus	marsh ribbonwood, houi	Malvaceae
Poa anceps	broad-leaved poa	Poaceae
Poa cita	silver tussock, wi	Poaceae
#*Podocarpus*	—	Podocarpaceae
Podocarpus nivalis	tauhinu, snow totara	Podocarpaceae
Podocarpus totara	totara	Podocarpaceae
Polystichum aculeatum	—	Dryopteridaceae
Polystichum vestitum	punui	Dryopteridaceae
**Populus*	poplar	Salicaceae
**Populus alba*	silver poplar, white poplar	Salicaceae
**Populus deltoides*	cottonwood, necklace poplar	Salicaceae
**Populus nigra*	lombardy poplar	Salicaceae
**Populus nigra* '*Italica*'	—	Salicaceae
Prumnopitys ferruginea	miro	Podocarpaceae
Pseudopanax	—	Araliaceae
Pseudopanax crassifolius	horoeka	Araliaceae
Pseudopanax lessonii	houpara	Araliaceae
Pseudopanax simplex = *Raukaua simplex*	haumakaroa	Araliaceae
Pseudowintera	—	Winteraceae
Pteridium	—	Dennstaedtiaceae
Pteridium aquilinum = *P. esculentum*	bracken fern	Dennstaedtiaceae
**Quercus*	oak	Fagaceae

Raoulia	mat daisy, vegetable sheep	Asteraceae
Raoulia eximia	vegetable sheep, tutahuna	Asteraceae
Raukaua edgerleyi	raukawa	Araliaceae
Rhopalostylis sapida	nikau	Arecaceae
**Rosmarinus officinalis*	rosemary	Lamiaceae
Rubus australis	tataramoa	Rosaceae
**Rubus fruticosus*	blackberry	Rosaceae
**Rubus idaeus*	raspberry	Rosaceae
**Rubus ursinus*	California blackberry	Rosaceae
**Saccharum*	sugarcane	Poaceae
Salicornia = *Sarcocornia*	—	Chenopodiaceae
**Salix*	willow	Salicaceae
**Salvia officinalis*	sage	Lamiaceae
**Salvia sclarea*	clary, clary sage	Lamiaceae
**Sambucus* 'Aurea'	Golden Elder	Caprifoliaceae
Scaevola gracilis	—	Goodeniaceae
Schefflera digitata	pate	Araliaceae
Scirpus	sedge	Cyperaceae
Scirpus fluviatilis = *Bolboschoenus fluviatilis*	marsh clubrush, kopungawha	Cyperaceae
Scirpus frondosus = *Desmoschoenus spiralis*	pingao	Cyperaceae
#*Senecio*	—	Asteraceae
**Senecio elegans*	purple groundsel	Asteraceae
**Senecio mikanioides*	German ivy	Asteraceae
Senecio minimus	fireweed	Asteraceae
#*Solanum*	nightshade	Solanaceae
Solanum aviculare	bullibul, poroporo	Solanaceae
**Solanum tuberosum*	potato	Solanaceae
#*Sonchus*	sowthistle, manga	Asteraceae
Sphagnum	sphagnum moss	Sphagnaceae
**Spiraea japonica*	—	Rosaceae
**Spiraea ulmaria*	meadowsweet	Rosaceae
**Sporobolus*	—	Poaceae
**Stellaria media*	chickweed, kohukohu	Caryophyllaceae
**Stenotaphrum glabrum*	buffalo grass	Poaceae
**Syringa vulgaris*	lilac	Oleaceae
**Tabebuia*	ipê	Bignoniaceae
**Tecoma*	trumpet bush, yellow bells	Bignoniaceae
**Teline monspessulana*	Montpellier broom	Fabaceae
**Trifolium*	clover, trefoil	Fabaceae
**Trifolium pratense*	red clover	Fabaceae
**Ulex europaeus*	gorse	Fabaceae
Uncinia	—	Cyperaceae
Urtica ferox	ongaonga	Urticaceae
**Vicia faba*	broad bean	Fabaceae
Vitex lucens	puriri	Verbenaceae
Weinmannia	—	Cunoniaceae
Weinmannia racemosa	kamahi	Cunoniaceae
Xeronema	Poor Knight's lily	Agavaceae
**Zea mays*	maize	Poaceae

Appendix C. Acronyms of entomological collections and museums.

AM Australian Museum, Sydney, NSW, Australia.

AMNZ Auckland War Memorial Museum, Auckland.

BMNH The Natural History Museum, London, England (formerly British Museum of Natural History).

BPBM Bernice P. Bishop Museum, Honolulu, Hawaii, USA.

CMNZ Canterbury Museum, Christchurch, New Zealand.

LUNZ Entomology Research Museum, Lincoln University, Lincoln, New Zealand.

MHNG Muséum d'Histoire Naturelle, Geneva, Switzerland.

MNHP Muséum National d'Histoire Naturelle, Paris, France.

MONZ Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand.

NHRM Naturhistoriska Riksmuseet, Stockholm, Sweden.

NZAC New Zealand Arthropod Collection, Landcare Research, Auckland, New Zealand.

OMNZ Otago Museum, Dunedin, New Zealand [now including BPNZ].

—— Perth Museum and Art Gallery, Perth, Scotland.

QM Queensland Museum, Brisbane, QLD, Australia.

SAMA South Australian Museum, Adelaide, SA, Australia.

UMB Übersee Museum, Bremen, Germany.

Appendix D. Alphabetical list of taxa incorrectly recorded or doubtfully established in New Zealand.

The current lists does not include taxa that have already been excluded from previous faunal checklists (e.g., Kirkaldy, 1909a; Wise, 1977).

Cicadellidae, Deltocephalinae, Athysanini

***Alodeltocephalus obliquus* (Evans, 1938)**

Day & Fletcher (1994: 1205) catalogued this species in detail for Australia. The only suggestion of the occurrence of this species in New Zealand is from Evans (1966), who stated that it was widely distributed in Australia and New Zealand. Day & Fletcher (1994) discussed the location of the specimen which should be considered the holotype of this species. Although synonymised with *A. longuinquus* by Evans (1966), *A. obliquus* was found to be distinct by Knight (1975). The male genitalia illustrated by Evans (1966) for *A. longuinquus* are in fact those of *A. obliquus* (Knight, 1975). Knight (1975) appears to have seen only one male from Tasmania and no material from New Zealand. To date no collection record from NZAC can support the presence of this Australian species in New Zealand.

***Limotettix incertus* Evans, 1966**

Day & Fletcher (1994: 1208) catalogued this species in detail for Australia. Knight (1975) had raised doubts about Evans' (1966) record of this species in New Zealand, writing that "It [*Limotettix*] was first recorded from New Zealand by Evans (1966), who listed Auckland and Greymouth as localities for *incerta*. *Cicadula awae*, which belongs to *Limotettix*, had been described earlier by Myers (1924) from Auckland and Chatham Island, however. Four species are described from New Zealand; all are endemic and distinct from *incerta*, whose presence in New Zealand has not been confirmed." To date no collection record from NZAC can support the presence of this Australian species in New Zealand.

Cicadellidae, Deltocephalinae, Macrostelini

***Balclutha rieki* Knight, 1987**

Knight's (1987) New Zealand record of this species was based on a single collecting event made in 1985 from the Auckland region: 3 males and 3 females, "Waitakere Ridge near Kauri Knoll, 20-25.iii.1985, malaise trap, mixed podocarp forest, A.D. Austin [BMNH]." There is no evi-

dence from NZAC, or from any other New Zealand collections, of this species having been collected prior to, or after that date, which suggests that the species is not established in New Zealand. The authors suspect the 1985 record was based either on stragglers, never resulting in established natural populations, or on mislabelled specimens.

Cicadellidae, Deltocephalinae, Scaphytopiini

***Japananus hyalinus* (Osborn, 1900)**

A single specimen is known from Auckland (Lynfield, 28 Jan 1989, B.A. Holloway, on window), but whether the species is established in New Zealand is yet to be confirmed.

Cicadellidae, Typhlocybinae, Typhlocybini

***Edwardsiana crataegi* (Douglas, 1876)**

There is no evidence of the occurrence of this species in New Zealand. The record of this species from New Zealand is derived from the synonymy between *E. crataegi* and *E. froggatti*, first proposed by Nast (1972). This synonymy appears to have been based on a publication by Günthart (1971) who showed that the two forms were capable of interbreeding in the laboratory. However, while males of *E. froggatti* were able to couple with females of *E. crataegi*, the longer apical aedeagal appendages of *E. crataegi* meant that the reverse combination was impossible. It is probable that the interbreeding that was observed was a laboratory artefact and that such behaviour may not occur naturally. The synonymy was neither accepted by Knight (1976a) nor by Wise (1977), who both listed only *E. froggatti* from New Zealand (under the generic name *Typhlocyba*). Charles (1989) followed Nast (1972) and recorded the name *E. crataegi* from New Zealand. However, in doing so he also indicated that NZAC contains two forms of males and implied that these corresponded with *E. froggatti* and *E. crataegi*. Knight (1976a) published illustrations of the genitalia which show that the form he examined in New Zealand is the form with the shorter apical aedeagal processes (i.e. *E. froggatti*). It was assumed that the second form mentioned by Charles (1989) was therefore either *E. crataegi* or *E. lethierryi*. Our examination of material from NZAC confirms that all specimens identified as *E. froggatti* by Knight (1976a) are in fact *E. froggatti*, and that *E. lethierryi* is the second species occurring in New Zealand.

Cicadellidae, Ulopinae, Cephalelini

***Paracephaleus montanus* (Evans, 1942)**

Day & Fletcher (1994) recorded *P. montanus* (Evans, 1942b) from Tasmania and New Zealand but this species does not occur in New Zealand.

Derbidae, Otiocerinae, Otiocerini

***Deribia coccinea* (Guérin-Méneville)**

Kirby (1885, *Elementary Textbook of Entomology* : 212) noted that this species was present in New Zealand but no evidence has been found to substantiate this record.

Flatidae, Flatinae, Nephesini

***Colgaroides acuminata* (Walker)**, the mango planthopper

This distinctive, relatively large species of Flatidae was recorded from New Zealand by Melichar (1902) but New Zealand was not included in the range of the species by Melichar (1923, *Genera Insectorum 182*: 61). No specimens are known to exist in collections and the record is here regarded as highly doubtful.

Ricaniidae

***Ricanoptera mellerborgi* (Stål)**

This species was recorded in New Zealand by Riley and Howard (1891: *Insect Life 3*: 424) as *Ricania discalis*, reported as being "exceedingly plentiful around Auckland during the last 8 or 10 years", particularly on cultivated passionfruit. This is almost certainly a misidentification of *Scolypopa australis* which remains as the only ricaniid recorded in New Zealand. The note does provide a measure of the likely timing of the species' introduction to New Zealand from Australia.

Appendix E. Geographical coordinates of main localities. Coordinates should read 00°00'S/000°00'E. The two-letter area codes follow Crosby *et al.* (1976, 1998). A "—" indicates a locality with unknown coordinates.

Acland Lagoon, Tasman Valley, Mount Cook, MK 4350/17006
Alex Knob, WD 4326/17009
Alexandra, CO 4515/16924
Altimarlock Peak, MB 4144/17351
Altimarlock Peak Hut, MB 4147/17350
Aniseed Valley, NN 4123/17309
Aorangi Mountains, WA 4127/17520
Aorangi, Poor Knights Islands, ND ... 3528/17444
Armstrong Saddle, Ruahine Range, RI 3946/17610
Arthurs Pass, NC 4254/17133
Ashburton, MC 4354/17145
Auckland, AK 3651/17446
Awarakau, Chatham Island, CH 4400/17638
Awatere Valley, MB 4137/17410
Awatotara Forest, Chatham Island, CH 4402/17636

Ball Hut, Tasman Valley, Mount Cook, MK 4337/17011
Balloon Hut, Mount Arthur, NN 4110/17237
Banks Peninsula, MC 4344/17253
Bastion Point, Auckland, AK 3650/17449
Bauza Island, FD 4517/16654
Bay of Islands, ND 3510/17411
Beaumont, CO/SL 4549/16931
Beebys Knob, NN 4144/17256
Belltopper Falls, Port Pegasus, SI 4709/16741
Ben Mohr, OL 4457/16832
Ben Nevis, NN 4133/17304
Big South Cape Island, SI 4715/16724
Birch Island, SL/DN 4554/16929
Black Birch Range, MB 4144/17350
Blackmount Homestead, Takitimu Range, SL 4545/16740
Blue Lake (Lake Tikitapu), BP 3811/17619
Blue Mountains, SL 4556/16920
Bluff Hill, Napier, HB 3928/17654
Borland Range, FD 4542/16728
Breaker Bay, Wellington, WN 4119/17449
Bream Bay, ND 3557/17427
Browns Bay, Auckland, AK 3643/17445
Bruce Park, Hunterville, WI 3957/17530
Buckland Peaks, Paparoa Range, BR 4153/17138
Bull Mound, WN 4059/17518
Bullock Creek, BR 4208/17129

Cannister Cove Scientific Reserve, Pitt Island, CH 4420/17613
Cape Foulwind, BR 4149/17128
Cape Kidnappers, HB 3938/17705
Cape Terawhiti, WN 4117/17437
Cass, MC 4302/17145
Castaway Camp, Great Island, TH ... 3410/17208
Castlecliff, WI 3957/17459
"Central Otago", CO 4514/16922
Charwell Forks School, KA 4225/17321
Chateau, Mount Ruapehu, TO 3911/17532
Chatham Island, CH 4352/17630
Chatham Islands, CH 4400/17630
Cheviot Face/Hills Face, Takitimu Range, SL 4537/16746
Christchurch, MC 4332/17238
Cleughearn Peak, FD 4549/16724
Clinton River, FD 4453/16754
Cobden Beach, BR 4225/17112
Coppermine Saddle, BR 4120/17321
Cornwallis, Auckland, AK 3700/17436
Coroglen, CL 3655/17541
Coromandel, CL 3645/17530
Coronet Peak, OL 4454/16844
Council Cave, NN 4052/17250
Craigieburn, MC 4306/17151
Crimea Range, MB 4209/17247
Croesus Knob (near), Paparoa Range, BR 4217/17122
Cuvier Island, CL 3626/17546

Dart Hut/Valley, OL 4431/16833
Days Bay, WN 4116/17454
Dee Stream, KA 4200/17344
Denniston, NN 4144/17148
Dolamore Park, SL 4603/16849
Double Cone, The Remarkables, CO 4504/16848
Dublin Terrace, Buller Gorge, BR 4148/17204
Dundas Hut/Ridge, Tararua Range, WN 4042/17527
Dunedin, DN 4553/17030
Dun Mountain, NN 4120/17322
D'Urville Island, SD 4050/17350
Dyers Pass, Banks Peninsula, MC ... 4337/17238

Eglinton Valley, FD 4508/16758
Erua, TO 3914/17524
Eves Valley, NN 4120/17303
Eyre Mountains, OL 4517/16835

Fell Peak, MB 4127/17324
Fisherman Island, NN 4059/17303
Fletcher Creek, BR 4159/17150
Flora Track, Mount Arthur, NN 4110/17243

Foxton, WI 4028/17517
Freshwater Creek, SI 4652/16755
Fruitlands, CO 4520/16918

Garvie Mountains, CO 4527/16854
Gertrude Saddle, FD 4444/16800
Gisborne, GB 3840/17801
Glentanner Station, Tasman Valley, MK 4509/17008
Glory Bay, Pitt Island, CH 4419/17618
Glory Scenic Reserve, Pitt Island, CH 4419/17612
Gollans Valley, WN 4121/17452
Governors Bay, Banks Peninsula, MC 4337/17238
Governors Bush, Mount Cook, MK 4344/17005
Great Barrier Island, CL 3614/17526
Great Island, TH 3410/17208
Greenlane, Auckland, AK 3653/17447
Greymouth, BR 4226/17111

Hanmer, MB 4232/17251
Hannahs Bay, Rotorua, BP 3807/17618
Hastings, HB 3938/17650
Haurangi, WA 4121/17523
Hawkswood Stream, NC 4266/17332
Henderson, Auckland, AK 3652/17437
Hermitage, Mount Cook, MK 4343/17005
Hokitika, WD 4242/17057
Hokonui Hills, SL 4559/16834
Hollyford Valley, FD 4432/16806
Hooker Valley, Mount Cook, MK 4343/17005
Houhora, ND 3447/17306
Huia, Auckland, AK 3659/17433
Huia Dam, Waitakere Ranges, AK 3657/17432
Hump Ridge, FD 4607/16719
Hunter Mountains, FD 4539/16723
Hunterville, WI 3957/17534
Hyde Rocks, CO 4523/16911

Island Creek, BR 4150/17137
Island Saddle, MB 4210/17247

Judd Ridge, WN 4054/17514

Kaeo, ND 3506/17346
Kaikoura, KA 4224/17341
Kaingaroa, Pitt Island, CH 4415/17615
Kaitaia, ND 3506/17315
Karori, Wellington, WN 4117/17445
Kea Point, Mount Cook, MK 4342/17004
Kekerengu, KA 4200/17400
Kelceys Bush, SC 4441/17057
Kermadec Islands, KE 2916/17755
Kerr Point, ND 3424/17259
Kirikiri Saddle, CL 3708/17538
Knuckle Hill, Westhaven Inlet, NN 4038/17233
Kohukohu, ND 3521/17332
Kokiri, BR 4229/17123

Lake Alta, The Remarkables, CO 4503/16848
Lake Harris, FD 4443/16810
Lake Ianthe State Forest, WD 4304/17037
Lake Kaniere, WD 4249/17108
Lake Mahinerangi, DN 4550/16953
Lake Manapouri, West Arm, FD 4530/16719
Lake Marian, FD 4447/16804
Lake McKay, Pisa Range, CO 4450/16912
Lake Orbell, FD 4517/16740
Lake Pukaki, MK 4354/17008
Lake Rotoiti, BR 4148/17250
Lake Rotoroa, BR 4149/17237
Lake Wahapo, WD 4315/17015
Lake Wairarapa, WA 4113/17517
Lake Wakatipu, OL 4505/16836
Levin, WN 4037/17517
Lewis Pass, BR 4222/17224
Lincoln, Christchurch, MC 4338/17229
Logan E Basin, Tararua Range, WN . 4043/17528
Longacre, Wanganui, WI 3942/17656
Longwood Range, SL 4615/16750
Lyall Bay, Wellington, WN 4119/17447
Lynfield, Auckland, AK 3655/17443

Macauley Island, KE 3014/17824
Mackenzie Pass, MK 4534/16708
Makara, WN 4116/17442
Makarora, Mount Aspiring, OL 4413/16913
Mamaku, BP 3806/17605
Mangahuia Stream, RI 3954/17555
Mangamuka Range, ND 3511/17328
Mangatawai Stream, TO 3909/17542
Mangere Island, CH 4416/17618
Mangonui, ND 3459/17331
Matamata, WO 3748/17546
Mataura River/Valley, OL 4539/16837
McLennans Bush, MC 4334/17132
Meggat Burn, Berwick State Forest, DN 4557/17005
Meyer Island, KE 2915/17752
Mokoreta No. 2, SL 4619/16907
Molesworth, MB 4205/17315
Monowai, FD 4547/16737
Mount Albert, Auckland, AK 3653/17443
Mount Alpha, WN 4059/17516
Mount Arthur, NN 4111/17242
Mount Augustus, NN 4141/17151
Mount Barber, FD 4530/16712
Mount Bitterness, CO 4445/17018
Mount Burns, FD 4544/16724
Mount Cook, MK 4336/17009
Mount Cook National Park, MK 4337/17010

Mount Domett, NN 4103/17218
Mount Earnslaw, OL 4439/16823
Mount Eden, Auckland, AK 3652/17445
Mount Grey, FD 4533/16714
Mount Grey, NC 4307/17232
Mount Hedgehope, SL 4611/16833
Mount Hercules, WD 4310/17027
Mount Holdsworth, WN 4052/17524
Mount Ida, CO 4455/17005
Mount Misery, BR 4155/17240
Mount Owen, NN 4133/17232
Mount Peel, NN 4108/17235
Mount Pureora, TO 4148/17225
Mount Rakeahua, SI 4656/16752
Mount Robert, BR 4149/17248
Mount Ruapehu, TO 3916/17534
Mount Sebastopol, MK 4345/17005
Mount Sewell, BR 4224/17120
Mount Snowflake, KA 4216/17331
Mount Stokes, SD 4103/17406
Mount Tapuae-o-Uenuku, KA 4159/17339
Mount Te Aroha, BP 3732/17544

Napier, HB 3930/17654
National Park, TO 3910/17523
Nelson, NN.....4117/17317
Nervous Knob, MC 4307/17140
New Brighton, Christchurch, MC 4330/17243
Ngauranga Gorge, Wellington, WN ...4114/17448
Nihotupu, Waitakere Ranges, AK 3658/17435
North Cape, ND 3424/17302
North End Lagoon, Chatham Island, CH 4346/17634
North Meyer Island, KE 2915/17752
North Peak, Big South Cape Island, SI 4713/16725

Oban, SI 4654/16807
Obelisk, Old Man Range, CO 4519/16912
Ocean Beach, ND 3549/17434
Ohakune, TO 3925/17525
Ohope Beach, BP 3757/17702
Ohuri, ND3525/17331
Okari River, BR 4149/17129
Okiwi, Great Barrier Island, CL 3609/17523
Old Man Range, CO 4523/16913
Omahuta State Forest, ND..... 3515/17337
Opepe Historical Reserve, TO 3846/17613
Oratia, Auckland, AK 3654/17436
Orepuki, SL..... 4616/16744
Orongorongo Field Station/River, WN 4124/17454
“Otago”, CO 4514/16922
Otahuna, MC 4340/17735
Otaki Beach, WN 4044/17506
Otaki Forks, WN 4052/17513
Otaki River, Levin, WN 4048/17511
Otira, WD 4249/17133
Owaka, SL 4627/16939

Paekakariki, WN 4059/17457
Paiaka, WI 4032/17520
Paihia, ND 3516/17405
Palmerston, DN 4529/17043
Palmerston North, WI 4021/17536
Paraparaumu Beach, WN 4053/17458
Parnell, Auckland, AK 3651/17446
Paynes Ford Scenic Reserve, Takaka, NN 4053/17249
Pearl Island, Port Pegasus, SI 4711/16742
Percy Saddle, FD..... 4533/16718
Pipiriki, Wanganui River, WI 3928/17502
Pisa Range, CO 4453/16910
Pitt Island, CH 4415/17613
Poor Knights Islands, ND 3527/17444
Pori, WA 4036/17556
Port Hills, Christchurch, MC 4335/17240
Port Pegasus, SI 4712/17641
Porters Pass, MC 4317/17144
Prices Valley, Banks Peninsula, MC .. 4346/17242
Puketi State Forest, ND 3513/17343
Puketoi, Waewaepa Range, WA..... 4030/17607
Punakaiki, BR 4206/17120
Pureora State Forest Park, TO 3845/17529

Queenstown, OL 4501/16839

Rainbow Ski Field, MB 4152/17250
Rakeahua Valley, SI 4659/16750
Rangiauria, Pitt Island, CH 4419/17616
Raoul Island, KE 2916/17755
Rastus Burn, CO 4500/16848
Raurimu, TO 3907/17523
Red Rocks, Wellington, WN 4121/17443
Red Tarns, Mount Cook, MK 4344/17005
Riccarton, Christchurch, MC 4332/17236
Richmond Range, MB 4132/17310
Riwaka, NN 4104/17259
Rock and Pillar Range, CO 4532/17001
Rocklands Station, CO 4540/16959
Ross Creek Reservoir, DN 4550/17030
Rotorua, BP 3809/17615
Ruahine Range, RI 3959/17605

Sealy Range, MK 4344/17003
Seaward Kaikoura Range, KA 4215/17333
Selwyn Bridge, MC 4338/17213
Selwyn River mouth, MC 4343/17226
Sentinel Peak, OL 4424/16914
Sharplin Falls, Bowyers Stream, MC . 4337/17124
Shingle Creek, CO 4525/16916

Ship Cove, SD 4105/17414
Shut Eye Camp, Ruahine Range, RI 3947/17610
Sign of the Kiwi, Banks Peninsula, MC 4336/17238
Silverstream, WN 4109/17501
Simonin Creek, Upper Pyke River, FD 4420/16820
Slopedown Range, SL 4622/16904
Smiths Ford, Maitai Valley, NN 4118/17321
Somes Island, WN 4115/17451
South East Bay, Great Island, TH 3410/17208
South East Island (Rangatira), CH ... 4421/17610
South Meyer Island, KE 2915/17752
South Peak, Big South Cape Island, SI 4714/16724
South West Island, TH 3410/17216
Spenser Mountains/Range, BR 4212/17235
Spirits Bay, ND 3427/17247
Springs Junction, BR 4219/17211
Springston, MC 4338/17225
Staveley, MC 4339/17126
Stephens Island, SD 4040/17400
Stewart Island, SI 4700/16800

Table Hill, SI 4702/16750
Tahunanui, NN 4117/17314
Taihape, RI 3940/17547
Takaka, NN 4050/17248
Takaka Hill, NN 4102/17551
Takitimu Range, SL 4542/16750
Tangimoana, WI 4017/17514
Tararua Range, WN 4028/17539
Tasman Bay, NN 4113/17305
Tasman River/Valley, MK 4350/17008
Tasman Valley, Great Island, TH 3410/17208
Tasman Valley, Mount Cook, MK 4343/17008
Taumarunui, TO 3852/17515
Taupo, TO 3841/17604
Tauweru, WA 4057/17547
Tawhiti Rahi, Poor Knights Islands, ND 3527/17444
Te Atatu, Auckland, AK 3650/17439
Te Kao, ND 3439/17258
Te Maraeora Flat, Little Barrier Island, CL 3613/17503
Te Paki, ND 3430/17247
Temple Basin, NC 4254/17134
Tengawai River, near Pleasant Point, SC 4415/17108
Terawhiti, WN 4116/17437
The Remarkables, CO 4504/16847
Thompson Sound, FD 4514/16659
Three Kings Islands, TH 3411/17204
Titahi Bay, WN 4106/17450
Titirangi, Auckland, AK 3656/17439
Tongariro National Park, TO 3913/17536
Tower Peak, Takitimu Range, SL 4538/16747
Travers Range, BR 4158/17243
Triplex Creek, Ruahine Range, RI 3947/17611
Tumbledown Bay, Banks Peninsula, MC 4351/17246
Turk Ridge, Crimea Range, MB 4207/17249
Turret Range, FD 4531/16720

Unuwhao, ND 3425/17253
Upper Hutt, WN 4107/17504
Ureti Beach, ND 3948/17604
Urquharts Bay, ND 3550/17432

Waewaepa Range, WA 4026/17603
Waikanae, WN 4052/17503
Waikato-Waipakihi Rivers junction, TO 3914/17547
Waikawau village, CL 3635/17531
Waikouaiti, DN 4535/17039
Waimangaroa, NN 4142/17145
Waimarino River, TO 3857/17551
Waimate, SC 4443/17102
Wainuiomata, WN 4115/17457
Waioku Coach Road Track, Mataraua Forest, ND 3534/17435
Waipapa Reserve, TO 3817/17540
Waipaua to Glory Bay, Pitt Island, CH 4418/17618
Waipoua State Forest, ND 3539/17333
Wairau-Rainbow Rivers Divide, MB .. 4201/17253
Wairau Valley, MB 4139/17312
Wairoa, GB 3902/17725
Waitakere Ranges, AK 3656/17432
Waitangi, Chatham Island, CH 4357/17627
Waitangi Estate, ND 3515/17404
Wallaby Creek, Mawhera State Forest, NN 4227/17131
Warawara State Forest, ND 3522/17318
Warkworth, AK 3623/17439
Wellington, WN 4115/17445
“West Coast”, WD 4246/17057
West Island, TH 3411/17202
Western Springs, Auckland, AK 3651/17443
Westport, BR 4144/17135
Whakarewarewa, BP 3809/17615
Whangamoa Saddle, NN 4113/17326
Whangaparaoa Peninsula, AK 3637/17445
Whangarei, ND 3543/17419
Whangarei Heads, ND 3548/17430
Whare Creek, Takitimu Range, SL 4538/16741
Wilmot Pass, FD 4530/16711
Wolfe Flat, FD 4531/16717

York Bay, Wellington, WN 4115/17454

Appendix F. Alphabetical list of valid taxa by areas of New Zealand. A = adventive; E = endemic; N = native but not endemic to New Zealand; R = endemic restricted to a single area of the country.

North Island

AK

64 taxa
E, 45; N, 8; A, 11; R, 1.

Achilidae
Achilus flammeus A
Agandecca annectens E
Aphrophoridae
Carystoterpa fingens E
Carystoterpa maori E
Carystoterpa subvirescens E
Carystoterpa vagans E
Cicadellidae
Anzygina agni E, R
Anzygina dumbletoni A?
Anzygina zealandica N
Arawa novella N
Arawa variegata E
Balclutha incisa A
Batracomorphus adventitiosus N
Batracomorphus angustatus N?
Edwardsiana froggatti A
Euacanthella palustris A
Eupteryx melissae A
Limotettix awae E
Maiestas knighti N
Maiestas vetus N
Nesoclutha phryne N
Novothymbris notata E
Novothymbris zealandica E
Paracephaleus hudsoni E
Ribautiana tenerrima A
Scaphetus brunneus E
Xestocephalus ovalis E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cauta E
Kikihia cutora cumberi E
Kikihia cutora cutora E
Kikihia dugdalei E
Kikihia laneorum E
Kikihia ochrina E
Kikihia scutellaris E
Notopsalta sericea E
Rhodopsalta cruentata E
Rhodopsalta leptomera E
Cixiidae
Aka finitima E
Cermada inexspectata E
Cermada punctimargo E
Huttia nigrifrons E
Koroana rufifrons E
Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Anchodelphax olenus E
Nilaparvata myersi E
Notohyus erosus E
Opiconsiva dilpa N?
Sulix miridianalis E
Sulix tasmani E
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Ugyops (*Ugyops*) *rhadamanthus* E
Derbidae
Eocenchrea maorica E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Membracidae
Acanthuchus trispinifer A
Myerslopiidae
Pemmation bifurca E
Pemmation parvum E
Ricaniidae
Scolypopa australis A

BP

46 taxa
E, 40; N, 3; A, 3; R, 1.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa fingens E
Carystoterpa minor E
Carystoterpa vagans E
Pseudaphronella jactator E
Cicadellidae
Anzygina toetoe E
Anzygina zealandica N
Nesoclutha phryne N
Arawa variegata E
Novothymbris notata E
Scaphetus brunneus E
Xestocephalus ovalis E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cauta E
Kikihia cutora cumberi E
Kikihia dugdalei E
Kikihia ochrina E
Kikihia scutellaris E
Maoricicada iolanthe E
Notopsalta sericea E
Rhodopsalta cruentata E
Rhodopsalta microdora E
Cixiidae
Aka finitima E
Cermada punctimargo E
Huttia nigrifrons E
Koroana rufifrons E
Parasemo hutchesoni E
Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Nilaparvata myersi E
Notogryps ithoma E
Opiconsiva dilpa N?
Sulix miridianalis E
Sulix tasmani E
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Ugyops (*Ugyops*) *rhadamanthus* E
Derbidae
Eocenchrea maorica E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Myerslopia tearohai E, R
Pemmation parvum E
Ricaniidae
Scolypopa australis A

CL

49 taxa
E, 39; N, 4; A, 6; R, 0.

Aphrophoridae
Carystoterpa fingens E
Carystoterpa minor E
Carystoterpa vagans E
Pseudaphronella jactator E
Cicadellidae
Anzygina dumbletoni A?
Anzygina zealandica N
Arahura dentata E
Arawa novella N
Euacanthella palustris A
Maiestas vetus N
Nesoclutha phryne N
Novothymbris notata E
Novothymbris zealandica E
Paracephaleus hudsoni E
Ribautiana tenerrima A
Scaphetus brunneus E
Xestocephalus ovalis E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cauta E

Kikihia cutora cumberi E
Kikihia cutora cutora E
Kikihia laneorum E
Kikihia scutellaris E
Maoricicada iolanthe E
Notopsalta sericea E
Rhodopsalta cruentata E
Cixiidae
Aka finitima E
Cermada inexspectata E
Cermada punctimargo E
Huttia nigrifrons E
Koroana rufifrons E
Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Nilaparvata myersi E
Notogryps ithoma E
Notohyus erosus E
Sulix tasmani E
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Ugyops (*Ugyops*) *rhadamanthus* E
Derbidae
Eocenchrea maorica E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation bifurca E
Pemmation parvum E
Ricaniidae
Scolypopa australis A

GB

28 taxa
E, 20; N, 2; A, 6; R, 0.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa vagans E
Pseudaphronella jactator E
Cicadellidae
Anzygina dumbletoni A?
Anzygina zealandica N
Arawa novella N
Arawa variegata E
Limotettix awae E
Rhytidodus decimaquartus A
Xestocephalus ovalis E
Cicadidae
Amphipsalta zelandica E
Kikihia cutora cumberi E
Kikihia dugdalei E
Kikihia laneorum E
Kikihia subalpina E
Maoricicada iolanthe E
Rhodopsalta microdora E
Cixiidae
Cermada punctimargo E
Koroana rufifrons E
Semo clypeatus E
Tiriteana clarkei E
Zeoliarus oppositus E
Delphacidae
Toya dryope A
Ugyops (*Paracona*) *pelorus* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation parvum E
Ricaniidae
Scolypopa australis A

HB

36 taxa
E, 22; N, 3; A, 11; R, 0.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa vagans E
Philaenus spumarius A
Pseudaphronella jactator E
Cicadellidae
Anzygina dumbletoni A?
Anzygina zealandica N
Arawa novella N
Edwardsiana froggatti A
Edwardsiana lethierryi A
Euacanthella palustris A
Eupteryx melissae A
Maiestas vetus N
Rhytidodus decimaquartus A
Scaphetus brunneus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta cingulata E
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia cutora cumberi E
Kikihia scutellaris E
Kikihia subalpina E
Maoricicada campbelli E
Notopsalta sericea E
Rhodopsalta microdora E
Cixiidae
Aka duniana E
Koroana rufifrons E
Zeoliarus oppositus E
Delphacidae
Toya dryope A
Derbidae
Eocenchrea maorica E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Myerslopia magna magna E
Pemmation parvum E
Ricaniidae
Scolypopa australis A

ND

60 taxa
E, 47; N, 7; A, 6; R, 4.

Achilidae
Agandecca annectens E
Aphrophoridae
Bathyllus albicinctus A
Carystoterpa chelyon E, R
Carystoterpa fingens E
Carystoterpa ikana E
Carystoterpa minima E, R
Carystoterpa minor E
Carystoterpa subvirescens E
Carystoterpa vagans E
Cicadellidae
Anzygina zealandica N
Arawa variegata E
Batracomorphus adventitiosus N
Euacanthella palustris A
Limotettix awae E
Limotettix pullatus N
Maiestas knighti N
Maiestas vetus N
Nesoclutha phryne N
Novothymbris extremitatis E, R
Novothymbris notata E
Novothymbris zealandica E
Paracephaleus hudsoni E
Scaphetus brunneus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cauta E
Kikihia cutora cutora E
Kikihia dugdalei E
Kikihia ochrina E
Notopsalta sericea E
Rhodopsalta cruentata E
Rhodopsalta leptomera E
Cixiidae
Aka finitima E
Cermada inexspectata E
Cermada punctimargo E
Huttia nigrifrons E
Huttia northlandica E, R
Koroana rufifrons E

Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Anchodelphax hagnon E
Anchodelphax olenus E
Eorissa cicatrifrons E
Nilaparvata myersi E
Notogryps ithoma E
Opiconsiva dilpa N?
Sulix miridianalis E
Sulix tasmani E
Toya dryope A
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Ugyops (*Ugyops*) *rhadamanthus* E
Derbidae
Eocenchrea maorica E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Ricaniidae
Scolypopa australis A

RI

26 taxa
E, 23; N, 2; A, 1; R, 0.

Aphrophoridae
Carystoterpa vagans E
Pseudaphronella jactator E
Cicadellidae
Anzygina ramsayi E
Anzygina toetoe E
Anzygina zealandica N
Scaphetus brunneus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Kikihia cauta E
Kikihia laneorum E
Kikihia muta muta E
Kikihia subalpina E
Maoricicada cassiope E
Maoricicada hamiltoni E
Notopsalta sericea E
Rhodopsalta cruentata E
Cixiidae
Aka finitima E
Aka rhodeae E
Koroana rufifrons E
Semo transinsularis E
Zeoliarus oppositus E
Delphacidae
Nilaparvata myersi E
Opiconsiva dilpa N?
Myerslopiidae
Pemmation parvum E
Pemmation verrucosum E
Ricaniidae
Scolypopa australis A

TK

29 taxa
E, 25; N, 1; A, 3; R, 0.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa fingens E
Carystoterpa vagans E
Philaenus spumarius A
Pseudaphronella jactator E
Cicadellidae
Nesoclutha phryne N
Novothymbris zealandica E
Scaphetus brunneus E
Zelopsis nothofagi E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cutora cumberi E
Kikihia laneorum E
Kikihia muta muta E
Kikihia ochrina E
Kikihia scutellaris E
Kikihia subalpina E
Maoricicada iolanthe E
Notopsalta sericea E
Rhodopsalta cruentata E
Cixiidae
Koroana rufifrons E
Semo clypeatus E
Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Sulix miridianalis E
Flatidae
Siphanta acuta A
Myerslopiidae
Myerslopia magna magna E
Ricaniidae
Scolypopa australis A

TO

54 taxa
E, 46; N, 6; A, 2; R, 1.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa vagans E
Philaenus spumarius A
Pseudaphronella jactator E
Cicadellidae
Anzygina zealandica N
Arawa negata E
Arawa novella N
Arawa pulchra N
Arawa variegata E
Batracomorphus adventitiosus N
Limotettix harrisi E, R
Maiestas knighti N
Maiestas vetus N
Novothymbris cithara E
Novothymbris zealandica E
Paracephaleus curtus E
Paracephaleus hudsoni E
Scaphetus brunneus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cauta E
Kikihia cutora cumberi E
Kikihia dugdalei E
Kikihia laneorum E
Kikihia ochrina E
Kikihia scutellaris E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada iolanthe E
Rhodopsalta cruentata E
Rhodopsalta microdora E
Cixiidae
Aka duniana E
Aka finitima E
Aka rhodeae E
Cermada inexspectata E
Huttia nigrifrons E
Koroana rufifrons E
Parasemo hutchesoni E
Semo clypeatus E
Semo transinsularis E
Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Nilaparvata myersi E
Sulix miridianalis E
Ugyops (*Ugyops*) *rhadamanthus* E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Myerslopiidae
Myerslopia magna magna E
Pemmation parvum E
Pemmation verrucosum E

WA

25 taxa

E, 19; N, 1; A, 5; R, 1.

Aphrophoridae
Carystoterpa maori E
Carystoterpa vagans E
Cicadellidae
Anzygina zealandica N
Arawa variegata E
Edwardsiana froggatti A
Rhytidodus decimaquartus A
Cicadidae
Amphipsalta cingulata E
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia cutora cumberi E
Kikihia muta muta E
Kikihia scutellaris E
Maoricicada cassiope E
Maoricicada hamiltoni E
Notopsalta sericea E
Cixiidae
Koroana rufifrons E
Zeoliarus oppositus E
Delphacidae
Notogryps melanthus E, R
Toya dryope A
Derbidae
Eocenchrea maorica E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation asperum asperum E
Pemmation parvum E
Pemmation terrestre E

WI

39 taxa

E, 31; N, 2; A, 6; R, 2.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa fingens E
Carystoterpa minor E
Carystoterpa vagans E
Philaenus spumarius A
Cicadellidae
Anzygina toetoe E
Anzygina zealandica N
Edwardsiana froggatti A
Idiocerus distinguendus A
Maiestas knighti N
Matatua maorica E, R
Xestocephalus ovalis E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cutora cumberi E
Kikihia muta muta E
Kikihia scutellaris E
Maoricicada hamiltoni E
Notopsalta sericea E
Rhodopsalta cruentata E
Rhodopsalta leptomera E
Cixiidae
Aka finitima E
Koroana rufifrons E
Zeoliarus oppositus E
Delphacidae
Anchodelphax olenus E
Eorissa cicatrifrons E
Nilaparvata myersi E
Notohyus erosus E
Sulix insecutor E, R
Sulix miridianalis E
Sulix tasmani E
Sulix vetranio E
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Derbidae
Eocenchrea maorica E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation verrucosum E
Ricaniidae
Scolypopa australis A

WN

73 taxa

E, 63; N, 6; A, 4; R, 5.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa aurata E, R
Carystoterpa fingens E
Carystoterpa ikana E
Carystoterpa maori E
Carystoterpa vagans E
Philaenus spumarius A
Pseudaphronella jactator E
Cicadellidae
Anzygina zealandica N
Arawa variegata E
Batracomorphus adventitiosus N
Batracomorphus angustatus N?
Limotettix awae E
Maiestas knighti N
Maiestas vetus N
Nesoclutha phryne N
Novothymbris cassiniae E
Novothymbris maorica E, R
Novothymbris punctata E, R
Novothymbris tararua E, R
Novothymbris zealandica E
Paracephaleus hudsoni E
Scaphetus brunneus E
Scaphetus simus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta cingulata E
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia cauta E
Kikihia cutora cumberi E
Kikihia dugdalei E
Kikihia laneorum E
Kikihia muta muta E
Kikihia muta pallida E
Kikihia ochrina E
Kikihia scutellaris E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada hamiltoni E
Maoricicada iolanthe E
Maoricicada myersi E, R
Notopsalta sericea E
Rhodopsalta cruentata E
Rhodopsalta leptomera E
Cixiidae
Aka duniana E
Aka finitima E
Huttia nigrifrons E
Koroana rufifrons E
Malpha muiri E
Semo transinsularis E
Tiriteana clarkei E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Delphacidae
Anchodelphax hagnon E
Anchodelphax olenus E
Eorissa cicatrifrons E
Nilaparvata myersi E
Sulix miridianalis E
Sulix tasmani E
Sulix vetranio E
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Ugyops (*Ugyops*) *rhadamanthus* E
Derbidae
Eocenchrea maorica E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation asperum asperum E
Pemmation parvum E
Pemmation terrestre E
Pemmation verrucosum E
Ricaniidae
Scolypopa australis A

WO
25 taxa
E, 19; N, 2; A, 4; R, 0.

Aphrophoridae
Carystoterpa ikana E
Carystoterpa vagans E
Pseudaphronella jactator E
Cicadellidae
Anzygina zealandica N
Arawa variegata E
Maiestas vetus N
Rhytidodus decimaquartus A
Scaphetus brunneus E
Xestocephalus ovalis E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Kikihia cutora cumberi E
Kikihia cutora cutora E
Kikihia dugdalei E
Maoricicada iolanthe E
Cixiidae
Aka rhodeae E
Koroana rufifrons E
Tiriteana clarkei E
Zeoliarus oppositus E
Delphacidae
Nilaparvata myersi E
Derbidae
Eocenchrea maorica E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation parvum E
Ricaniidae
Scolypopa australis A

South Island

BR
49 taxa
E, 45; N, 2; A, 2; R, 1.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa maori E
Carystoterpa vagans E
Cicadellidae
Anzygina ramsayi E
Anzygina zealandica N
Arawa variegata E
Horouta inconstans E
Limotettix awae E
Nesoclutha phryne N
Novothymbris cithara E
Novothymbris hinemoa E
Novothymbris peregrina E
Novothymbris vagans E
Novothymbris zealandica E
Paracephaleus hudsoni E
Paradorydium philpotti E
Scaphetus brunneus E
Scaphetus simus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta zelandica E
Kikihia angusta E
Kikihia horologium E
Kikihia muta muta E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada hamiltoni E
Maoricicada mangu gourlayi E
Maoricicada mangu mangu E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Maoricicada tenuis E
Cixiidae
Aka westlandica E
Koroana lanceloti E
Koroana rufifrons E
Malpha cockcrofti E
Malpha muiri E
Semo clypeatus E
Semo harrisi E
Semo transinsularis E
Zeoliarus atkinsoni E
Zeoliarus oppositus E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Siphanta acuta A
Membracidae
Acanthuchus trispinifer A
Myerslopiidae
Myerslopia magna amplificata E, R
Pemmation parvum E
Pemmation variabile variabile E

CO
36 taxa
E, 26; N, 4; A, 6; R, 2.

Aphrophoridae
Philaenus spumarius A
Cicadellidae
Anzygina zealandica N
Arawa negata E
Batracomorphus angustatus N?
Horouta inconstans E
Idiocerus distinguendus A
Limotettix awae E
Macrosteles fieberi A
Maiestas knighti N
Nesoclutha phryne N
Novolopa falcata E
Novolopa montivaga E
Paradorydium aculeatum E, R
Rhytidodus decimaquartus A
Ribautiana tenerrima A
Scaphetus simus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Kikihia angusta E
Kikihia muta pallida E
Kikihia rosea E
Maoricicada campbelli E
Maoricicada clamitans E
Maoricicada nigra frigida E, R
Maoricicada otagoensis otagoensis E
Maoricicada phaeoptera E
Rhodopsalta microdora E
Cixiidae
Aka westlandica E
Koroana lanceloti E
Zeoliarus oppositus E
Delphacidae
Anchodelphax hagnon E
Eorissa cicatrifrons E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Siphanta acuta A
Myerslopiidae
Pemmation townsendi E

DN
21 taxa
E, 18; N, 2; A, 1; R, 0.

Aphrophoridae
Carystoterpa vagans E
Philaenus spumarius A
Cicadellidae
Arawa negata E
Batracomorphus adventitiosus N
Horouta inconstans E
Nesoclutha phryne N
Novothymbris castor E
Paracephaleus hudsoni E
Scaphetus brunneus E
Xestocephalus ovalis E
Cicadidae
Amphipsalta zelandica E
Kikihia angusta E
Kikihia muta muta E
Kikihia rosea E
Kikihia subalpina E
Rhodopsalta microdora E
Cixiidae
Aka dunedinensis E
Semo harrisi E
Semo southlandiae E

Zeoliarus oppositus E
Myerslopiidae
Pemmation townsendi E

FD

35 taxa
E, 34; N, 1; A, 0; R, 3.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa vagans E
Cicadellidae
Anzygina zealandica N
Arahura reticulata E
Arawa negata E
Arawa variegata E
Horouta inconstans E
Limotettix awae E
Maiestas knighti N
Novolopa falcata E
Novolopa infula E, R
Novolopa kuscheli E
Novolopa maculata E
Novothymbris notialis E
Novothymbris peregrina E
Novothymbris vagans E
Novothymbris zealandica E
Paradorydium philpotti E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta zelandica E
Kikihia angusta E
Kikihia rosea E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Cixiidae
Aka westlandica E
Koroana arthuria E
Koroana lanceloti E
Semo harrisi E
Zeoliarus oppositus E
Myerslopiidae
Myerslopia magna scabrata E, R
Myerslopia whakatipuensis E, R
Pemmation townsendi E

KA

23 taxa
E, 22; N, 1; A, 0; R, 1.

Aphrophoridae
Carystoterpa fingens E
Carystoterpa vagans E
Cicadellidae
Anzygina zealandica N
Arawa negata E
Novothymbris eylesi E, R
Scaphetus simus E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia horologium E
Kikihia muta muta E
Kikihia paxillulae E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada hamiltoni E
Maoricicada lindsayi E
Maoricicada mangu multicostata E
Rhodopsalta cruentata E
Cixiidae
Aka duniana E
Koroana rufifrons E
Zeoliarus oppositus E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E

MB

38 taxa
E, 32; N, 2; A, 4; R, 3.

Achilidae
Agandecca annectens E
Cicadellidae
Arawa dugdalei E
Arawa negata E
Arawa variegata E
Batracomorphus angustatus N?
Edwardsiana froggatti A
Horouta inconstans E
Nesoclutha phryne N
Novothymbris cassiniae E
Paradorydium watti E, R
Rhytidodus decimaquartus A
Scaphetus brunneus E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia angusta E
Kikihia horologium E
Kikihia muta muta E
Kikihia scutellaris E
Maoricicada alticola E, R
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada hamiltoni E
Maoricicada lindsayi E
Maoricicada mangu celer E, R
Maoricicada mangu multicostata E
Maoricicada oromelaena E
Maoricicada tenuis E
Rhodopsalta cruentata E
Cixiidae
Koroana lanceloti E
Koroana rufifrons E
Semo clypeatus E
Zeoliarus oppositus E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A
Myerslopiidae
Myerslopia magna magna E
Pemmation parvum E
Ricaniidae
Scolypopa australis A

MC

56 taxa
E, 40; N, 5; A, 11; R, 3.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa vagans E
Philaenus spumarius A
Cicadellidae
Anzygina dumbletoni A?
Anzygina zealandica N
Arahura reticulata E
Arawa negata E
Batracomorphus adventitiosus N
Edwardsiana froggatti A
Edwardsiana lethierryi A
Eupteryx melissae A
Horouta inconstans E
Idiocerus distinguendus A
Kybos lindbergi A
Kybos smaragdula A
Limotettix awae E
Maiestas knighti N
Nesoclutha phryne N
Novothymbris castor E
Novothymbris pollux E, R
Paradorydium westwoodi E, R
Rhytidodus decimaquartus A
Ribautiana tenerrima A
Scaphetus simus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia angusta E
Kikihia horologium E
Kikihia muta muta E
Kikihia muta pallida E
Kikihia ochrina E
Kikihia rosea E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada hamiltoni E

Maoricicada mangu mangu E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Rhodopsalta microdora E
Cixiidae
Aka duniana E
Aka westlandica E
Koroana arthuria E
Koroana rufifrons E
Semo clypeatus E
Semo southlandiae E
Zeoliarus oppositus E
Delphacidae
Eorissa cicatrifrons E
Notohyus erosus E
Opiconsiva dilpa N?
Ugyops (*Paracona*) *pelorus* E
Flatidae
Anzora unicolor A
Siphanta acuta A
Myerslopiidae
Pemmation asperum cognatum E, R

MK

37 taxa
E, 29; N, 6; A, 2; R, 1.

Aphrophoridae
Philaenus spumarius A
Cicadellidae
Anzygina zealandica N
Arawa negata E
Batracomorphus adventitiosus N
Batracomorphus angustatus N?
Horouta inconstans E
Limotettix awae E
Limotettix pallidus E, R
Macrosteles fieberi A
Maiestas knighti N
Maiestas vetus N
Matatua montivaga E
Nesoclutha phryne N
Novothymbris castor E
Scaphetus simus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Kikihia angusta E
Kikihia horologium E
Kikihia muta pallida E
Kikihia rosea E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada clamitans E
Maoricicada hamiltoni E
Maoricicada mangu mangu E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Maoricicada phaeoptera E
Rhodopsalta microdora E
Cixiidae
Koroana arthuria E
Koroana lanceloti E
Semo harrisi E
Semo southlandiae E
Zeoliarus oppositus E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E

NC

33 taxa
E, 29; N, 2; A, 2; R, 0.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa maori E
Carystoterpa vagans E
Philaenus spumarius A
Cicadellidae
Arawa negata E
Horouta inconstans E
Idiocerus distinguendus A
Maiestas vetus N
Nesoclutha phryne N
Novothymbris castor E
Novothymbris zealandica E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia angusta E
Kikihia horologium E
Kikihia muta muta E
Kikihia paxillulae E
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada hamiltoni E
Maoricicada lindsayi E
Maoricicada mangu mangu E
Maoricicada mangu multicostata E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Rhodopsalta cruentata E
Rhodopsalta microdora E
Cixiidae
Koroana arthuria E
Semo clypeatus E
Semo harrisi E
Zeoliarus oppositus E

NN

65 taxa
E, 50; N, 5; A, 10; R, 5.

Achilidae
Agandecca annectens E
Carystoterpa fingens E
Carystoterpa maori E
Carystoterpa vagans E
Cicadellidae
Anzygina dumbletoni A?
Anzygina zealandica N
Arawa dugdalei E
Arawa novella N
Arawa variegata E
Batracomorphus angustatus N?
Edwardsiana froggatti A
Euacanthella palustris A
Eupteryx melissae A
Horouta inconstans E
Limotettix awae E
Maiestas vetus N
Nesoclutha phryne N
Novolopa townsendi E, R
Novothymbris cithara E
Novothymbris hinemoa E
Novothymbris zealandica E
Paracephaleus curtus E
Paracephaleus hudsoni E
Paradorydium cuspis E, R
Paradorydium gourlayi E, R
Rhytidodus decimaquartus A
Ribautiana tenerrima A
Scaphetus brunneus E
Scaphetus simus E
Xestocephalus ovalis E
Zelopsis nothofagi E
Cicadidae
Amphipsalta strepitans E
Amphipsalta zelandica E
Kikihia horologium E
Kikihia muta muta E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada cassiope E
Maoricicada clamitans E
Maoricicada mangu gourlayi E
Maoricicada mangu mangu E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Maoricicada tenuis E
Rhodopsalta cruentata E
Cixiidae
Aka duniana E
Aka westlandica E
Confuga persephone E, R
Koroana lanceloti E
Koroana rufifrons E
Semo clypeatus E
Semo harrisi E
Semo transinsularis E
Zeoliarus oppositus E
Delphacidae
Eorissa cicatrifrons E
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* E
Flatidae
Anzora unicolor A

Siphanta acuta [A]
Membracidae
Acanthuchus trispinifer [A]
Myerslopiidae
Myerslopia magna magna [E]
Pemmation insulare [E, R]
Pemmation parvum [E]
Pemmation townsendi [E]
Pemmation variabile variabile [E]
Ricaniidae
Scolypopa australis [A]

OL
37 taxa
E, 30; N, 4; A, 3; R, 1.

Achilidae
Agandecca annectens [E]
Aphrophoridae
Philaenus spumarius [A]
Cicadellidae
Anzygina zealandica [N]
Arahura reticulata [E]
Arawa negata [E]
Horouta inconstans [E]
Idiocerus distinguendus [A]
Limotettix awae [E]
Maiestas knighti [N]
Maiestas vetus [N]
Matatua montivaga [E]
Nesoclutha phryne [N]
Novolopa maculata [E]
Novothymbris zealandica [E]
Paradorydium sertum [E, R]
Rhytidodus decimaquartus [A]
Scaphetus brunneus [E]
Xestocephalus ovalis [E]
Zelopsis nothofagi [E]
Cicadidae
Amphipsalta zelandica [E]
Kikihia angusta [E]
Kikihia muta muta [E]
Kikihia rosea [E]
Kikihia subalpina [E]
Maoricicada campbelli [E]
Maoricicada clamitans [E]
Maoricicada nigra nigra [E]
Maoricicada oromelaena [E]
Maoricicada otagoensis otagoensis [E]
Maoricicada phaeoptera [E]
Rhodopsalta microdora [E]
Cixiidae
Aka westlandica [E]
Koroana arthuria [E]
Koroana lanceloti [E]
Semo harrisi [E]
Zeoliarus oppositus [E]
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* [E]

SC
21 taxa
E, 17; N, 1; A, 3; R, 0.

Aphrophoridae
Carystoterpa vagans [E]
Philaenus spumarius [A]
Cicadellidae
Anzygina zealandica [N]
Horouta inconstans [E]
Idiocerus distinguendus [A]
Rhytidodus decimaquartus [A]
Xestocephalus ovalis [E]
Zelopsis nothofagi [E]
Cicadidae
Amphipsalta strepitans [E]
Amphipsalta zelandica [E]
Kikihia angusta [E]
Kikihia subalpina [E]
Maoricicada campbelli [E]
Maoricicada clamitans [E]
Maoricicada mangu mangu [E]
Maoricicada oromelaena [E]
Maoricicada otagoensis otagoensis [E]
Maoricicada phaeoptera [E]
Rhodopsalta microdora [E]
Cixiidae
Zeoliarus oppositus [E]
Myerslopiidae
Pemmation variabile austrinum [E]

SD
28 taxa
E, 26; N, 2; A, 0; R, 3.

Achilidae
Agandecca annectens [E]
Aphrophoridae
Carystoterpa fingens [E]
Carystoterpa maori [E]
Carystoterpa vagans [E]
Cicadellidae
Anzygina zealandica [N]
Arahura gourlayi [E, R]
Maiestas vetus [N]
Novothymbris hinemoa [E]
Novothymbris tararua [E]
Paradorydium insulare [E, R]
Scaphetus brunneus [E]
Xestocephalus ovalis [E]
Cicadidae
Amphipsalta strepitans [E]
Amphipsalta zelandica [E]
Kikihia muta muta [E]
Kikihia scutellaris [E]
Kikihia subalpina [E]
Maoricicada campbelli [E]
Maoricicada cassiope [E]
Cixiidae
Aka duniana [E]
Koroana rufifrons [E]
Zeoliarus oppositus [E]
Delphacidae
Sulix miridianalis [E]
Ugyops (*Paracona*) *pelorus* [E]
Dictyopharidae
Thanatodictya (*Niculda*) *tillyardi* [E]
Myerslopiidae
Myerslopia magna magna [E]
Pemmation montis [E, R]
Pemmation parvum [E]

SL
32 taxa
E, 26; N, 4; A, 2; R, 3.

Aphrophoridae
Carystoterpa vagans [E]
Cicadellidae
Anzygina barrattae [E, R]
Anzygina zealandica [N]
Arawa negata [E]
Batracomorphus adventitiosus [N]
Horouta inconstans [E]
Idiocerus distinguendus [A]
Limotettix awae [E]
Nesoclutha phryne [N]
Novolopa montivaga [E]
Novothymbris notialis [E]
Rhytidodus decimaquartus [A]
Scaphetus brunneus [E]
Scaphetus simus [E]
Xestocephalus ovalis [E]
Zelopsis nothofagi [E]
Cicadidae
Amphipsalta zelandica [E]
Kikihia angusta [E]
Kikihia rosea [E]
Maoricicada otagoensis maceweni [E, R]
Rhodopsalta microdora [E]
Cixiidae
Aka dunedinensis [E]
Aka westlandica [E]
Koroana arthuria [E]
Koroana rufifrons [E]
Semo harrisi [E]
Semo southlandiae [E]
Zeoliarus oppositus [E]
Delphacidae
Opiconsiva dilpa [N?]
Myerslopiidae
Myerslopia tawhai [E, R]
Pemmation townsendi [E]
Pemmation variabile austrinum [E]

WD

34 taxa

E, 26; N, 5; A, 3; R, 1.

Achilidae
Agandecca annectens E
Aphrophoridae
Carystoterpa vagans E
Cicadellidae
Anzygina zealandica N
Arawa negata E
Arawa novella N
Idiocerus distinguendus A
Limotettix awae E
Maiestas knighti N
Maiestas vetus N
Novothymbris zealandica E
Ribautiana tenerrima A
Scaphetus brunneus E
Xestocephalus ovalis E
Cicadidae
Amphipsalta zelandica E
Kikihia horologium E
Kikihia muta muta E
Kikihia rosea E
Kikihia subalpina E
Maoricicada campbelli E
Maoricicada hamiltoni E
Maoricicada nigra nigra E
Maoricicada oromelaena E
Rhodopsalta cruentata E
Cixiidae
Aka westlandica E
Koroana lanceloti E
Malpha cockcrofti E
Semo harrisi E
Zeoliarus oppositus E
Delphacidae
Opiconsiva dilpa N?
Flatidae
Siphanta acuta A
Myerslopiidae
Pemmation parvum E
Pemmation simile E, R
Pemmation townsendi E
Pemmation variabile variabile E

Stewart Island

20 taxa

E, 18; N, 1; A, 1; R, 1.

Aphrophoridae
Carystoterpa vagans E
Cicadellidae
Arawa negata E
Arawa novella N
Novolopa kuscheli E
Novothymbris notialis E
Novothymbris zealandica E
Paradorydium philpotti E
Scaphetus brunneus E
Scaphetus simus E
Zelopsis nothofagi E
Cicadidae
Amphipsalta zelandica E
Kikihia angusta E
Kikihia rosea E
Kikihia subalpina E
Cixiidae
Aka westlandica E
Koroana arthuria E
Semo harrisi E
Zeoliarus oppositus E
Myerslopiidae
Myerslopia rakiuraensis E, R
Ricaniidae
Scolypopa australis A

Offshore Islands

CH

13 taxa

E, 8; N, 4; A, 1; R, 4.

Aphrophoridae
Carystoterpa tristis E, R
Cicadellidae
Anzygina zealandica N
Arawa novella N
Eupteryx melissae A
Limotettix awae E
Maiestas knighti N
Novothymbris solitaria E, R
Xestocephalus ovalis E
Cicadidae
Kikihia longula E, R
Cixiidae
Chathamaka andrei E, R
Delphacidae
Anchodelphax olenus E
Opiconsiva dilpa N?
Ugyops (*Paracona*) *pelorus* E

KE

13 taxa

E, 5; N, 5; A, 3; R, 4.

Aphrophoridae
Carystoterpa subtacta E, R
Cicadellidae
Balclutha lucida A?
Balclutha viridinervis A?
Batracomorphus angustatus N?
Exitianus plebeius N
Maiestas samuelsoni N
Maiestas vetus N
Orosius argentatus A
Cicadidae
Kikihia cutora exulis E, R
Cixiidae
Cermada kermadecensis E, R
Delphacidae
Sardia rostrata pluto N
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Paracona*) *raouli* E, R

TH

23 taxa

E, 18; N, 4; A, 1; R, 4.

Aphrophoridae
Basilioterpa bullata E, R
Carystoterpa fingens E
Carystoterpa trimaculata E, R
Cicadellidae
Anzygina zealandica N
Arahura dentata E
Arawa variegata E
Batracomorphus adventitiosus N
Batracomorphus angustatus N?
Eupteryx melissae A
Maiestas knighti N
Novothymbris notata E
Xestocephalus ovalis E
Cicadidae
Amphipsalta cingulata E
Amphipsalta zelandica E
Notopsalta sericea E
Cixiidae
Cermada triregia E, R
Zeoliarus oppositus E
Delphacidae
Anchodelphax olenus E
Nilaparvata myersi E
Sulix miridianalis E
Ugyops (*Paracona*) *pelorus* E
Ugyops (*Ugyops*) *caelatus* E
Myerslopiidae
Myerslopia triregia E, R

Appendix G. Type localities of valid Auchenorrhyncha taxa from New Zealand.

AK Auckland

Auckland
Carystoterpa subvirescens (Aphrophoridae)
Kikihia ochrina (Cicadidae)
Limotettix awae (Cicadellidae)
Auckland?
Aka finitima (Cixiidae)
Carystoterpa fingens (Aphrophoridae)
Cermada punctimargo (Cixiidae)
Greenlane, Auckland
Anzygina agni (Cicadellidae)
Nihotupu, Waitakere Ranges
Ugyops (*Ugyops*) *rhadamanthus* (Delphacidae)
Waitakere Ranges
Pemmation bifurca (Myerslopiidae)
Waitemata Harbour?
Notopsalta sericea (Cicadidae)

BP Bay of Plenty

Blue Lake, Rotorua
Carystoterpa minor (Aphrophoridae)
Mamaku
Tiriteana clarkei (Cixiidae)
Mount Te Aroha
Carystoterpa vagans (Aphrophoridae)
Myerslopia tearohai (Myerslopiidae)
Ohope Beach
Ugyops (*Paracona*) *pelorus* (Delphacidae)
Rotorua
Sulix miridianalis (Delphacidae)
Whakarewarewa, Rotorua
Kikihia dugdalei (Cicadidae)

BR Buller

Bullock Creek, Punakaiki
Myerslopia magna amplificata (Myerslopiidae)
Lake Rotoiti
Carystoterpa maori (Aphrophoridae)
Westport, Island Creek area
Novothymbris cithara (Cicadellidae)

CH Chatham Islands

Chatham Island, Awatotara Forest
Novothymbris solitaria (Cicadellidae)
Pitt Island
Kikihia longula (Cicadidae)
Pitt Island, Glory Scenic Reserve
Chathamaka andrei (Cixiidae)

CL Coromandel

Cuvier Island
Arahura dentata (Cicadellidae)

CO Central Otago

Mount Bitterness
Paradorydium aculeatum (Cicadellidae)
Old Man Range
Novolopa montivaga (Cicadellidae)
Old Man Range, near Obelisk
Maoricicada nigra frigida (Cicadidae)

DN Dunedin

Lake Mahinerangi
Novothymbris castor (Cicadellidae)
Ross Creek Reservoir
Aka dunedinensis (Cixiidae)
Waikouaiti ?
Kikihia angusta (Cicadidae)
Kikihia rosea (Cicadidae)

FD Fiordland

Bauza Island
Aka westlandica (Cixiidae)
Cleughearn Peak
Maoricicada oromelaena (Cicadidae)
Eglinton Valley
Novothymbris peregrina (Cicadellidae)
Hump Ridge
Paradorydium philpotti (Cicadellidae)
Lake Marian Track
Myerslopia whakatipuensis (Myerslopiidae)
Monowai, Road to Mount Burns
Novothymbris vagans (Cicadellidae)
Mount Barber
Novolopa infula (Cicadellidae)
Mount Burns
Arahura reticulata (Cicadellidae)
Mount Grey
Novolopa falcata (Cicadellidae)
Wilmot Pass
Myerslopia magna scabrata (Myerslopiidae)

HB Hawkes Bay

Cape Kidnappers
Rhodopsalta microdora (Cicadidae)

KA Kaikoura

Charwell Forks
Kikihia paxillulae (Cicadidae)
Dee Stream, Kekerengu
Amphipsalta strepitans (Cicadidae)
Mount Snowflake
Novothymbris eylesi (Cicadellidae)

KE Kermadec Islands

Kermadec Islands
Kikihia cutora exulis (Cicadidae)
Raoul Island
Cermada kermadecensis (Cixiidae)
Ugyops (*Paracona*) *raouli* (Delphacidae)
Raoul Island, North Terrace
Maiestas samuelsoni (Cicadellidae)

MB Marlborough

Altimarlock Peak
Arawa dugdalei (Cicadellidae)
Maoricicada mangu multicostata (Cicadidae)
Fell Peak
Arawa variegata (Cicadellidae)
Island Saddle
Maoricicada tenuis (Cicadidae)
Molesworth
Paradorydium watti (Cicadellidae)
Turk Ridge, Crimea Range
Maoricicada alticola (Cicadidae)
Maoricicada mangu celer (Cicadidae)

MC Mid Canterbury
Christchurch, Near
Paradorydium westwoodi (Cicadellidae)
McLennans Bush, Christchurch
Novothymbris pollux (Cicadellidae)
Pemmation asperum cognatum (Myerslopiidae)
Porters Pass
Maoricicada mangu mangu (Cicadidae)
Riccarton, Christchurch
Anzygina dumbletoni (Cicadellidae)
Tumbledown Bay, Banks Peninsula
Notohyus erosus (Delphacidae)

MK Mackenzie
Hooker Valley, North of Hermitage
Horouta inconstans (Cicadellidae)
Kea Point Track, Mount Cook
Kikihia horologium (Cicadidae)
Mackenzie Pass
Maoricicada clamitans (Cicadidae)
Mount Sebastopol, Red Lakes [=Tarns]
Matatua montivaga (Cicadellidae)
Sealy Range, Mount Cook
Kikihia muta pallida (Cicadidae)
Tasman Valley, Glen Tanner Station
Maiestas knighti (Cicadellidae)
Tasman Valley, North of Lake Pukaki
Limotettix pallidus (Cicadellidae)
Tasman Valley, South of Ball Hut
Maiestas vetus (Cicadellidae)

NC North Canterbury
Arthur's Pass
Koroana arthuria (Cixiidae)
Maoricicada hamiltoni (Cicadidae)
Mount Grey
Maoricicada lindsayi (Cicadidae)

ND Northland
Bay of Islands
Amphipsalta cingulata (Cicadidae)
Kaitaia
Carystoterpa chelyon (Aphrophoridae)
Mangamuka Range
Carystoterpa ikana (Aphrophoridae)
Mangonui
Notogryps ithoma (Delphacidae)
North Cape, Kerr Point
Carystoterpa minima (Aphrophoridae)
Omahuta State Forest
Huttia northlandica (Cixiidae)
Paihia
Scaphetus brunneus (Cicadellidae)
Unuwhao
Novothymbris extremitatis (Cicadellidae)
Whangarei
Batracomorphus adventitiosus (Cicadellidae)
Novothymbris notata (Cicadellidae)

NN Nelson
Aniseed Valley
Zelopsis nothofagi (Cicadellidae)
Council Cave, Takaka
Confuga persephone (Cixiidae)
Dun Mountain
Aka duniana (Cixiidae)
Maoricicada cassiope (Cicadidae)
Maoricicada mangu gourlayi (Cicadidae)
Novothymbris zealandica (Cicadellidae)
Thanatodictya (*Niculda*) *tillyardi* (Dictyopharidae)
Mount Arthur
Paradorydium cuspis (Cicadellidae)
Mount Augustus
Paracephaleus curtus (Cicadellidae)
Mount Owen
Novolopa townsendi (Cicadellidae)
Nelson
Novothymbris hinemoa (Cicadellidae)
Scaphetus simus (Cicadellidae)
Palmers Bush, Nelson
Pemmation insulare (Myerslopiidae)
Tahunanui, Nelson
Paradorydium gourlayi (Cicadellidae)
Takaka Hill
Pemmation variabile variabile (Myerslopiidae)
Tasman Bay
Amphipsalta zelandica (Cicadidae)

NZ New Zealand
Agandecca annectens (Achilidae)
Arawa negata (Cicadellidae)
Eocenchrea maorica (Derbidae)
Carystoterpa trimaculata (Aphrophoridae)
Koroana rufifrons (Cixiidae)
Rhodopsalta cruentata (Cicadidae)
Semo clypeatus (Cixiidae)
Ugyops (*Ugyops*) *caelatus* (Delphacidae)
Zeoliarus oppositus (Cixiidae)

OL Otago Lakes
Coronet Peak
Maoricicada otagoensis otagoensis (Cicadidae)
Novolopa maculata (Cicadellidae)
Paradorydium sertum (Cicadellidae)
Dart Hut
Koroana lanceloti (Cixiidae)
Sentinel Peak
Maoricicada phaeoptera (Cicadidae)

RI Rangitikei
Ruahine Range
Anzygina ramsayi (Cicadellidae)

SC South Canterbury
Kelceys Bush, Waimate
Pemmation variabile austrinum (Myerslopiidae)

SD Marlborough Sounds
Mount Stokes
Pemmation montis (Myerslopiidae)
Ship Cove?
Kikihia muta muta (Cicadidae)
Stephens Island
Arahura gourlayi (Cicadellidae)
Paradorydium insulare (Cicadellidae)

SI Stewart Island
Mount Rakeahua
Novolopa kuscheli (Cicadellidae)
Novothymbris notialis (Cicadellidae)
Oban
Myerslopia rakiuraensis (Myerslopiidae)

SL Southland
Ajax Swamp
Anzygina barrattae (Cicadellidae)
Cheviot Face, Takitimu Range
Maoricicada otagoensis maceweni (Cicadidae)
Longwood Range
Myerslopia tawhai (Myerslopiidae)
Tower Peak, Takitimu Range
Semo southlandiae (Cixiidae)

TH Three Kings Islands
Great Island, Castaway Camp
Cermada triregia (Cixiidae)
Great Island, Tasman Valley
Myerslopia triregia (Myerslopiidae)
West Island
Basilioterpa bullata (Aphrophoridae)

TO Taupo
Mangatawai Stream
Kikihia cutora cumberi (Cicadidae)
Ohakune
Arawa pulchra (Cicadellidae)
Kikihia cauta (Cicadidae)
Limottetix harrisi (Cicadellidae)
Pemmation parvum (Myerslopiidae)
Opepe Historical Reserve
Kikihia laneorum (Cicadidae)
Waimarino River
Myerslopia magna magna (Myerslopiidae)
Waipapa Reserve, Pureora State Forest Park
Aka rhodeae (Cixiidae)
Cermada inexspectata (Cixiidae)
Parasemo hutchesoni (Cixiidae)

WA Wairarapa
Puketoi
Notogryps melanthus (Delphacidae)

WD Westland
Lake Wahapo
Pemmation townsendi (Myerslopiidae)
Mount Hercules
Pemmation simile (Myerslopiidae)
Otira
Malpha cockcrofti (Cixiidae)
Maoricicada campbelli (Cicadidae)
Temple Basin
Maoricicada nigra nigra (Cicadidae)
“West Coast”
Semo harrisi (Cixiidae)

WI Wanganui
Bruce Park, Hunterville
Pemmation verrucosum (Myerslopiidae)
Foxton
Sulix vetranio (Delphacidae)
Longacre
Matatua maorica (Cicadellidae)
Paiaka
Anchodelphax olenus (Delphacidae)
Anzygina toetoe (Cicadellidae)
Sulix insecutor (Delphacidae)

WN Wellington
Breaker Bay, Wellington
Paracephaleus hudsoni (Cicadellidae)
Day’s Bay
Kikihia cauta (Cicadidae)
Gollans Valley
Zeoliarus atkinsoni (Cixiidae)
Karori, Wellington
Kikihia cauta (Cicadidae)
Kikihia subalpina (Cicadidae)
Maoricicada iolanthe (Cicadidae)
Levin
Eorissa cicatrifrons (Delphacidae)
Lyall Bay, Wellington
Rhodopsalta leptomera (Cicadidae)
Mount Alpha
Malpha muiri (Cixiidae)
Nilaparvata myersi (Delphacidae)
Novothymbris tararua (Cicadellidae)
Orongorongo Field Station
Pemmation terrestre (Myerslopiidae)
Orongorongo River
Maoricicada myersi (Cicadidae)
Otaki Forks
Pemmation asperum asperum (Myerslopiidae)
Silverstream
Carystoterpa aurata (Aphrophoridae)
Tararua Range
Anzygina zealandica (Cicadellidae)
Tararua Range, Dundas Hut
Semo transinsularis (Cixiidae)
Titahi Bay
Anchodelphax hagnon (Delphacidae)
Upper Hutt
Huttia nigrifrons (Cixiidae)
Waikanae
Sulix tasmani (Delphacidae)
Wainuiomata
Novothymbris maorica (Cicadellidae)
Wellington
Kikihia cauta (Cicadidae)
Novothymbris cassiniae (Cicadellidae)
Novothymbris punctata (Cicadellidae)
Xestocephalus ovalis (Cicadellidae)

Appendix H. Endemic species currently known from 10 populations or fewer.

Aphrophoridae
Basilioterpa bullata
Carystoterpa aurata
Carystoterpa chelyon
Carystoterpa ikana
Carystoterpa minima
Carystoterpa minor
Carystoterpa subtacta
Carystoterpa subvirescens
Carystoterpa trimaculata
Carystoterpa tristis

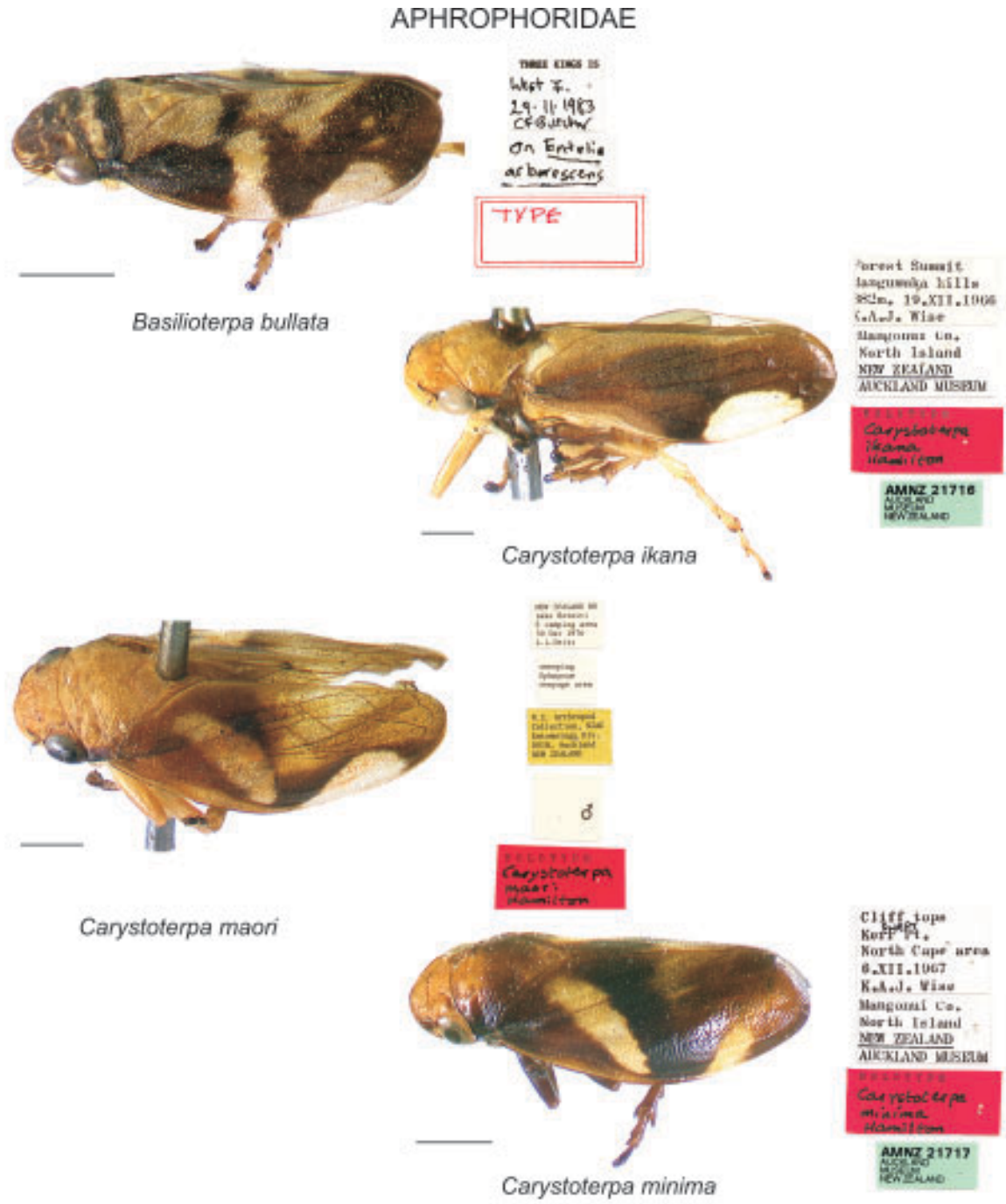
Cicadellidae
Anzygina barrattae
Anzygina ramsayi
Anzygina toetoe
Arahura dentata
Arahura gourlayi
Arahura reticulata
Arawa dugdalei
Limotettix harrisi
Limotettix pallidus
Matatua maorica
Matatua montivaga
Novolopa falcata
Novolopa infula
Novolopa kuscheli
Novolopa maculata
Novolopa montivaga
Novolopa townsendi
Novothymbris cassiniae
Novothymbris cithara
Novothymbris extremitatis
Novothymbris eylesi
Novothymbris hinemoa
Novothymbris maorica
Novothymbris peregrina
Novothymbris pollux
Novothymbris punctata
Novothymbris solitaria
Novothymbris tararua
Novothymbris vagans
Paracephaleus curtus
Paradorydium aculeatum
Paradorydium cuspis
Paradorydium gourlayi
Paradorydium insulare
Paradorydium philpotti
Paradorydium sertum
Paradorydium watti
Paradorydium westwoodi

Cicadidae
Kikihia cutora exulis
Kikihia muta pallida
Kikihia paxillulae
Maoricicada alticola
Maoricicada mangu celer
Maoricicada mangu gourlayi
Maoricicada myersi
Maoricicada nigra frigida
Maoricicada otagoensis maceweni
Rhodopsalta leptomera

Cixiidae
Aka dunedinensis
Aka rhodeae
Cermada kermadecensis
Cermada triregia
Chathamaka andrei
Confuga persephone
Huttia northlandica
Malpha cockcrofti
Malpha muiri
Parasemo hutchesoni
Semo southlandiae
Semo transinsularis

Delphacidae
Anchodelphax hagnon
Anchodelphax olenus
Eorissa cicatrifrons
Notogryps ithoma
Notogryps melanthus
Notohyus erosus
Sulix insecutor
Sulix vetranio
Ugyops (*Paracona*) *raouli*

Myerslopiidae
Myerslopia magna amplificata
Myerslopia magna scabrata
Myerslopia rakiuraensis
Myerslopia tawhai
Myerslopia tearohai
Myerslopia triregia
Myerslopia whakatipuensis
Pemmation asperum asperum
Pemmation asperum cognatum
Pemmation bifurca
Pemmation insulare
Pemmation montis
Pemmation simile
Pemmation terrestre
Pemmation variabile austrinum
Pemmation verrucosum



Colour photographs of primary types of Auchenorrhyncha (pp. 149–191) deposited in New Zealand collections and museums. Presented alphabetically by families, genera and species. (Photographs: Birgit Rhode; *Kikihia muta pallida, K. subalpina* – Raymond Coory; *Maoricicada cassiope* – Jean-Claude Stahl). Scale bars = 1 mm unless otherwise indicated.





Carystoterpa minor





Carystoterpa vagans

CICADELLIDAE



Anzygina agni, male genitalia



Anzygina barrattae



Anzygina ramsayi



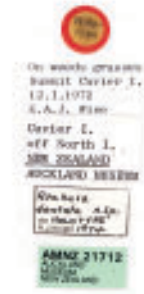
Anzygina toetoe



Anzygina zealandica

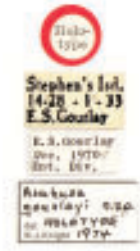






Arahura dentata





Arahura gourlayi





Arahura reticulata





Arawa dugdalei





Arawa pulchra





Arawa variegata





Batracomorphus adventitiosus



Horouta inconstans



Limotettix awae



Limotettix harrisi



Limotettix pallidus





Maiestas samuelsoni





Maiestas vetus





Matatua maorica





Matatua montivaga





Novolopa falcata





Novolopa infula





Novolopa kuscheli





Novolopa maculata





Novolopa montivaga





Novolopa townsendi





Novothymbris cassiniae





Novothymbris castor





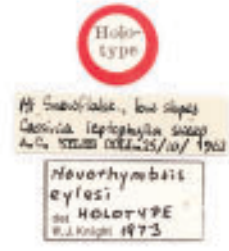
Novothymbris cithara





Novothymbris extremitatis





Novothymbris eylesi





Novothymbris notata





Novothymbris notialis





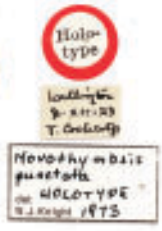
Novothymbris peregrina





Novothymbris pollux





Novothymbris punctata





Novothymbris solitaria





Novothymbris tararua





Novothymbris vagans





Novothymbris zealandica





Paracephaleus curtus





Paracephaleus hudsoni





Paradorydium aculeatum





Paradorydium gourlayi





Paradorydium insulare





Paradorydium philpotti





Paradorydium sertum





Paradorydium watti



Scaphetus brunneus



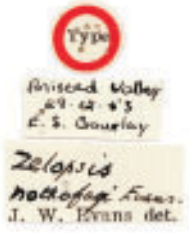


Scaphetus simus





Zelopsis nothofagi



CICADIDAE

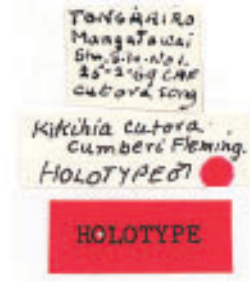


Amphipsalta strepitans





Kikihia cutora cumberi



Scale bars = 10 mm

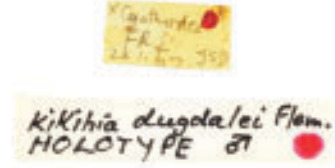


Kikihia cutora exulis





Kikihia dugdalei



Scale bars = 10 mm

Scale bars = 10 mm



Kikihia horologium





Kikihia laneorum



Scale bars = 10 mm

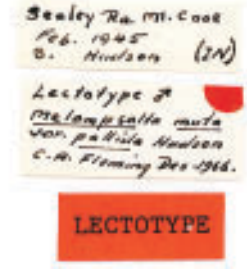


Kikihia longula





Kikihia muta pallida



Scale bars = 10 mm

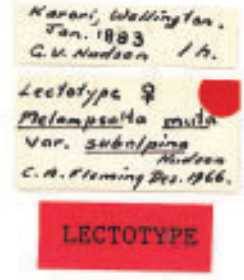


Kikihia paxillulae





Kikihia subalpina



Scale bars = 10 mm



Turk Ridge, Crimea Ra. Upper Waiau R., M.B. 6500-6900' on burnet tussock. 3 Feb. 71 J.S.H.
HOLOTYPE ♂

HOLOTYPE ♂
Maoricicada alticola Dugdale + Fleming 1978

Maoricicada alticola



Para-type
Otira 10-1-20
J.G. Myers Coll. B.M. 1967-316

Melampsalta campbelli ♀ Myers

Maoricicada campbelli

Scale bars = 10 mm



Maoricicada cassiope





Maoricicada clamitans



Scale bars = 10 mm

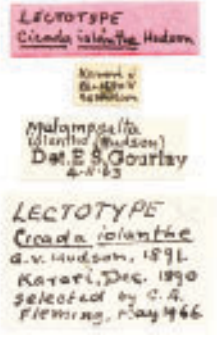


Maoricicada hamiltoni





Maoricicada iolanthe



Scale bars = 10 mm



Maoricicada lindsayi



Maoricicada mangu celer

Scale bars = 10 mm



Maoricicada mangu gourlayi



Maoricicada mangu multicostata

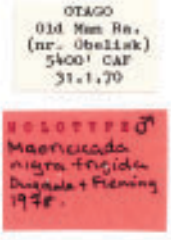
Scale bars = 10 mm





Maoricicada myersi





Maoricicada nigra frigida

Scale bars = 10 mm





Maoricicada oromelaena





Maoricicada otagoensis maceweni

Scale bars = 10 mm



Maoricicada otagoensis otagoensis



Maoricicada phaeoptera

Scale bars = 10 mm



Maoricicada tenuis



Rhodopsalta microdora

Scale bars = 10 mm

CIXIIDAE



NEW ZEALAND DN
Ross Ck. Reservoir
15 Apr 1980
B. L. P. Barrett

HOLOTYPE
Aka
dunedinensis sp. nov.
Larivière, 1999

Aka dunedinensis



Type

Holotype

Aka duniana



NEW ZEALAND TO
Pureora
Waipapa Res.570m
26 Jun 1984
J. Hutchenson

Malaise trap in
shrublands

HOLOTYPE
Aka
rhodei
Larivière, 1999

Aka rhodeae



HOLOTYPE
Aka
westlandica sp. nov.
Larivière, 1999

Aka westlandica



Cermada inexspectata







Cermada kermadecensis



Cermada triregia







Chathamaka andrei



Huttia nigrifrons



Huttia northlandica



Koroana arthuria



Koroana lanceloti





Malpha cockcrofti





Malpha muiri





Parasemo hutchesoni





Semo harrisi



Semo southlandiae



Semo transinsularis

DELPHACIDAE





Anchodelphax hagnon





Anchodelphax olenus



Eorissa cicatrifrons





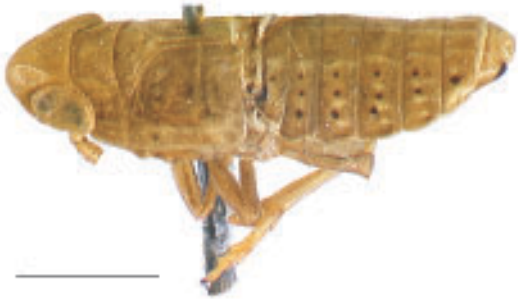
Nilaparvata myersi



Notogryps ithoma



Notogryps melanthus



Notohyus erosus



Sulix insecutor



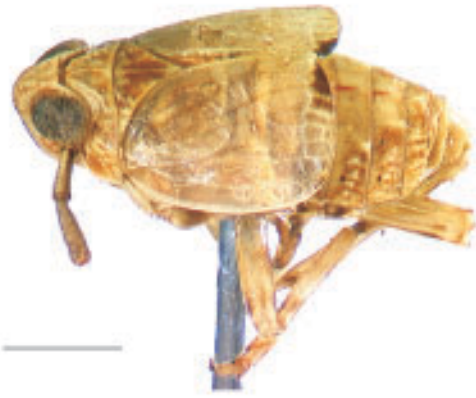
Sulix tasmani







Sulix vetranio



Ugyops pelorus







Ugyops rhadamanthus

DICTYOPHARIDAE





Thanatodictya tillyardi

MYERSLOPIIDAE



Myerslopia magna amplificata



Myerslopia magna magna



Myerslopia magna scabrata



Myerslopia rakiuraensis





Myerslopia tawhai





Myerslopia tearohai





Myerslopia triregia





Myerslopia whakatipuensis





Pemmation asperum asperum





Pemmation asperum cognatum





Pemmation bifurca





Pemmation insulare



Pemmation montis



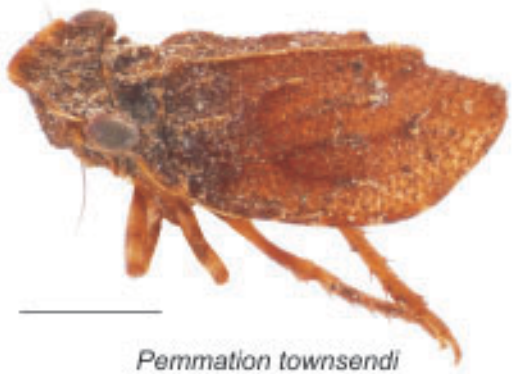
Pemmation parvum



Pemmation simile



Pemmation terrestre



Holo-type

Litter

Myersiopia townsendi n.sp. HOLOTYPE 1972

Pemmation townsendi



Holo-type

Litter

Myersiopia variabilis austrinum n.subsp. HOLOTYPE 1972

Pemmation variabile austrinum



Holo-type

Beech Forest

Forest Litter

Myersiopia variabilis n.sp. HOLOTYPE 1972

Pemmation variabile variabile



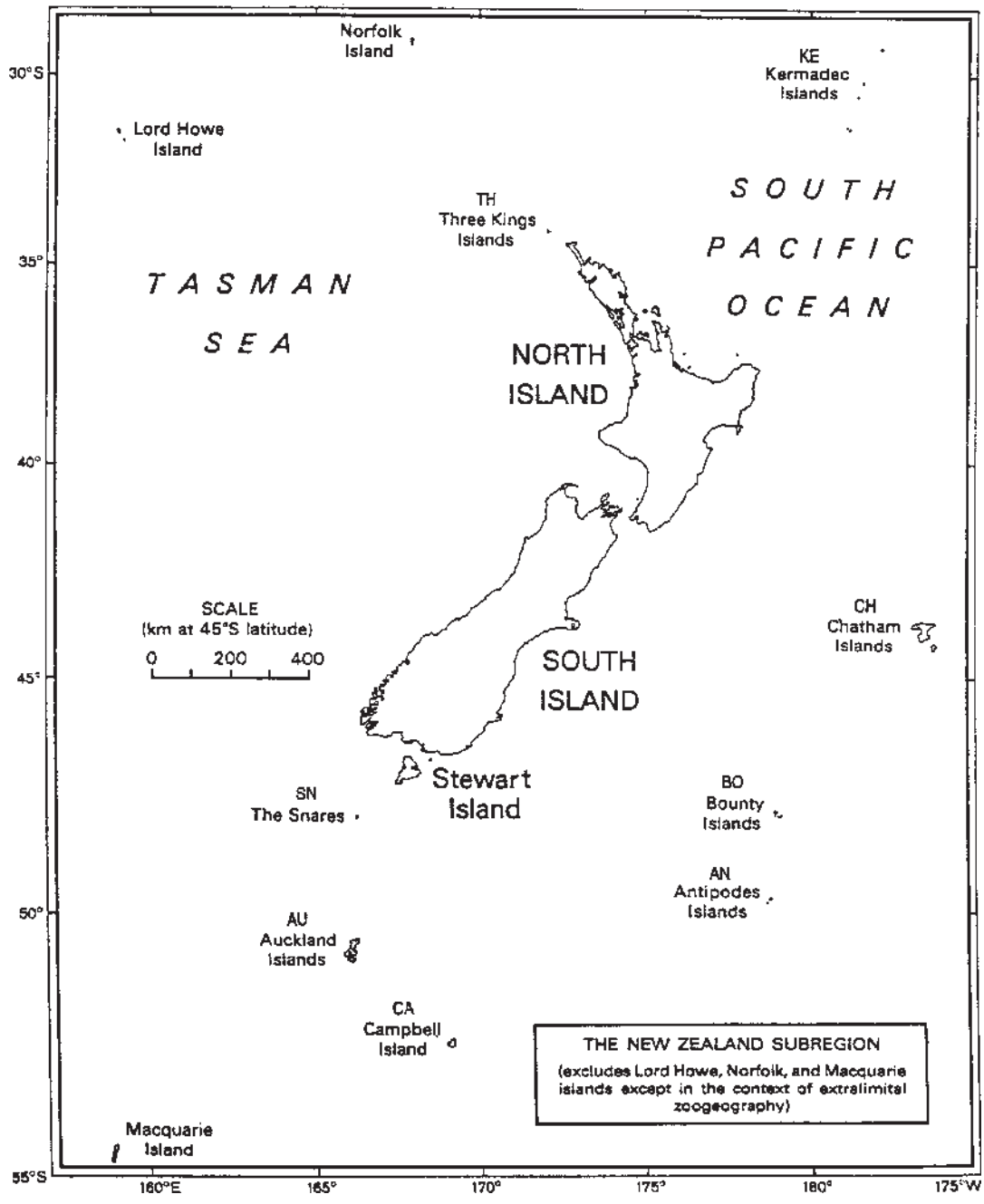
Holo-type

Bruce Park Hunterville 2-12-65 L.P.Marchant

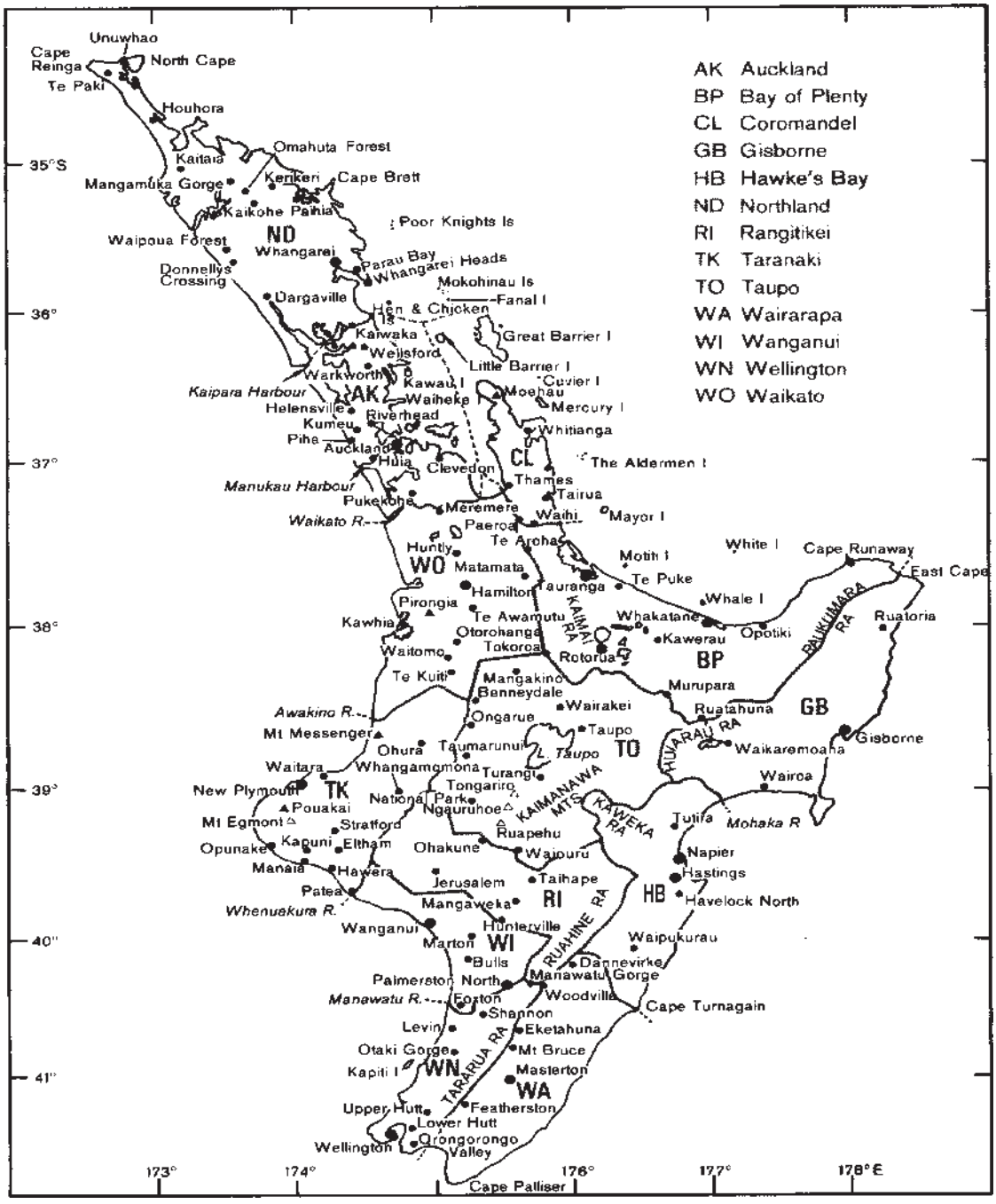
Forest Litter

Myersiopia verrucosa n.sp. HOLOTYPE 1972

Pemmation verrucosum



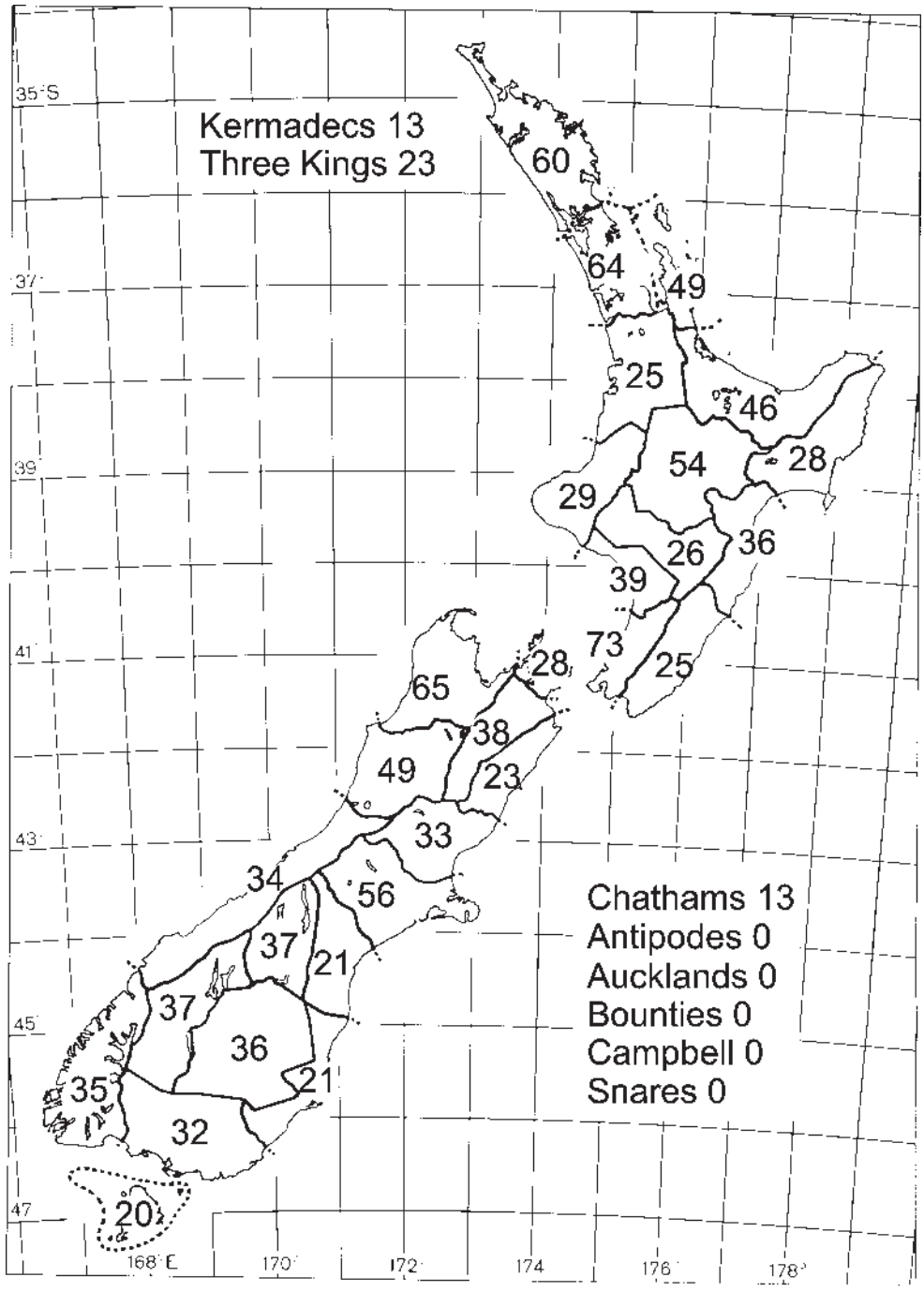
Map 1. The New Zealand subregion with area codes.



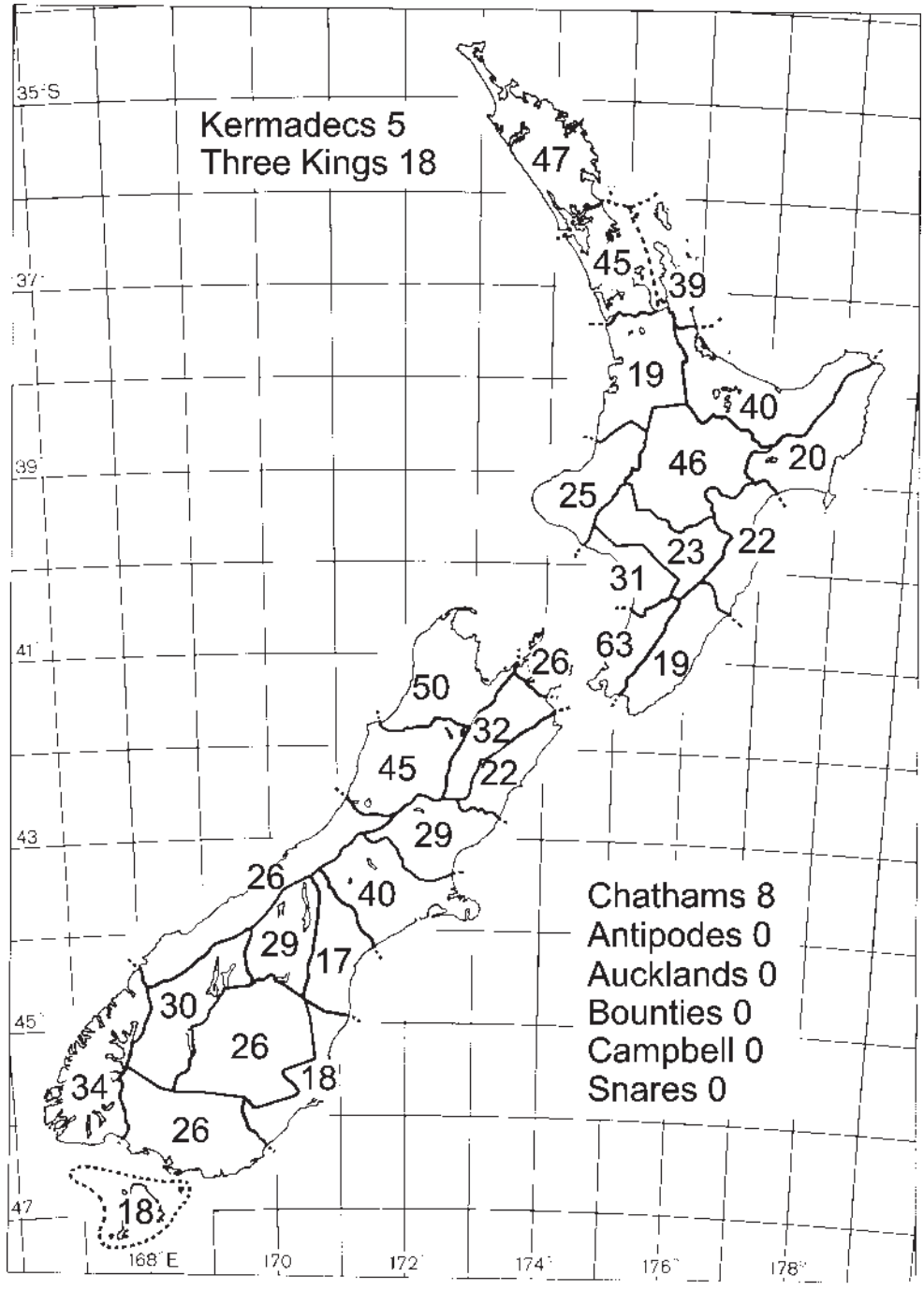
Map 2. Area codes and collecting localities from mainland New Zealand, North Island.



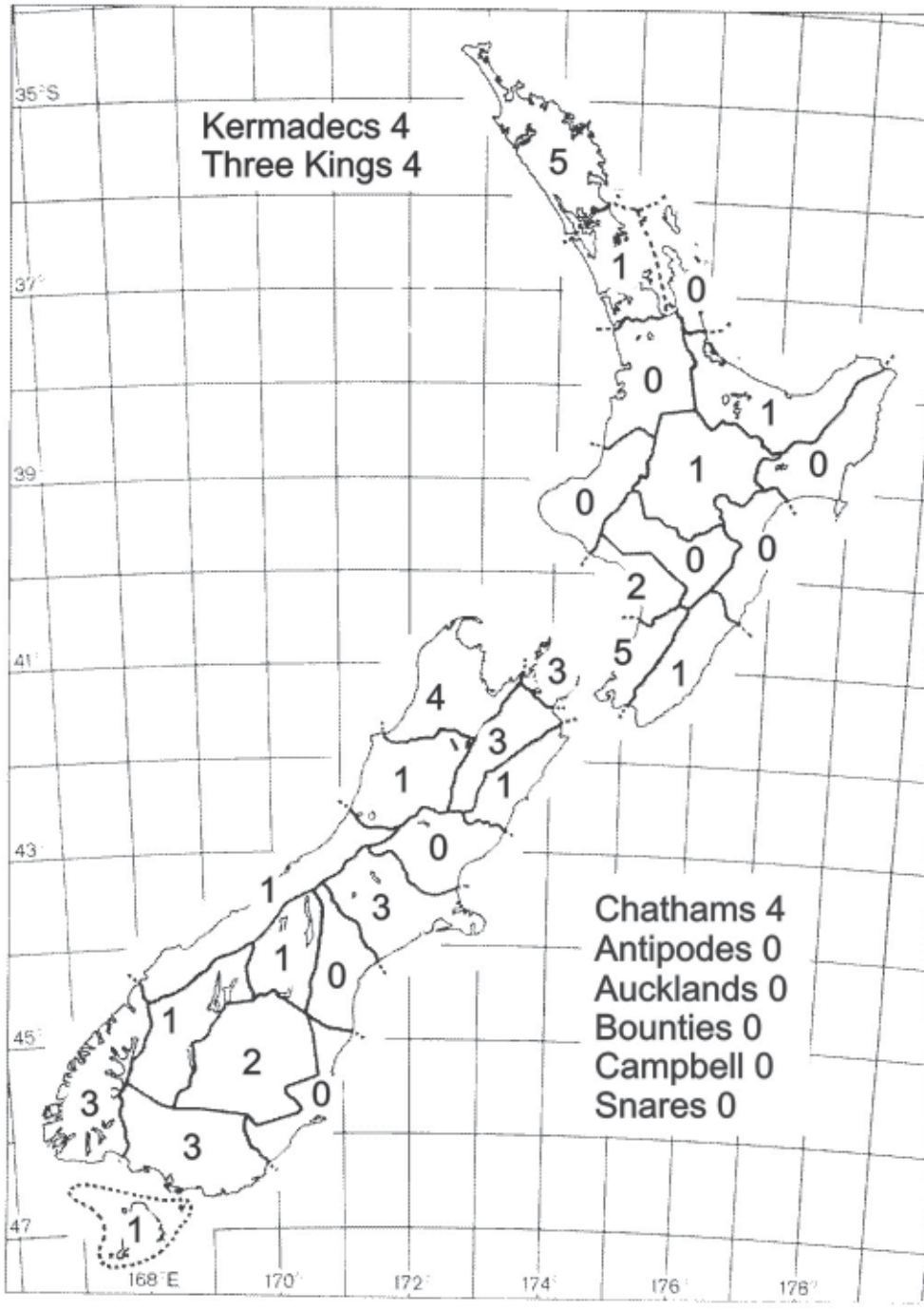
Map 3. Area codes and collecting localities from mainland New Zealand, South Island, and Stewart Island.



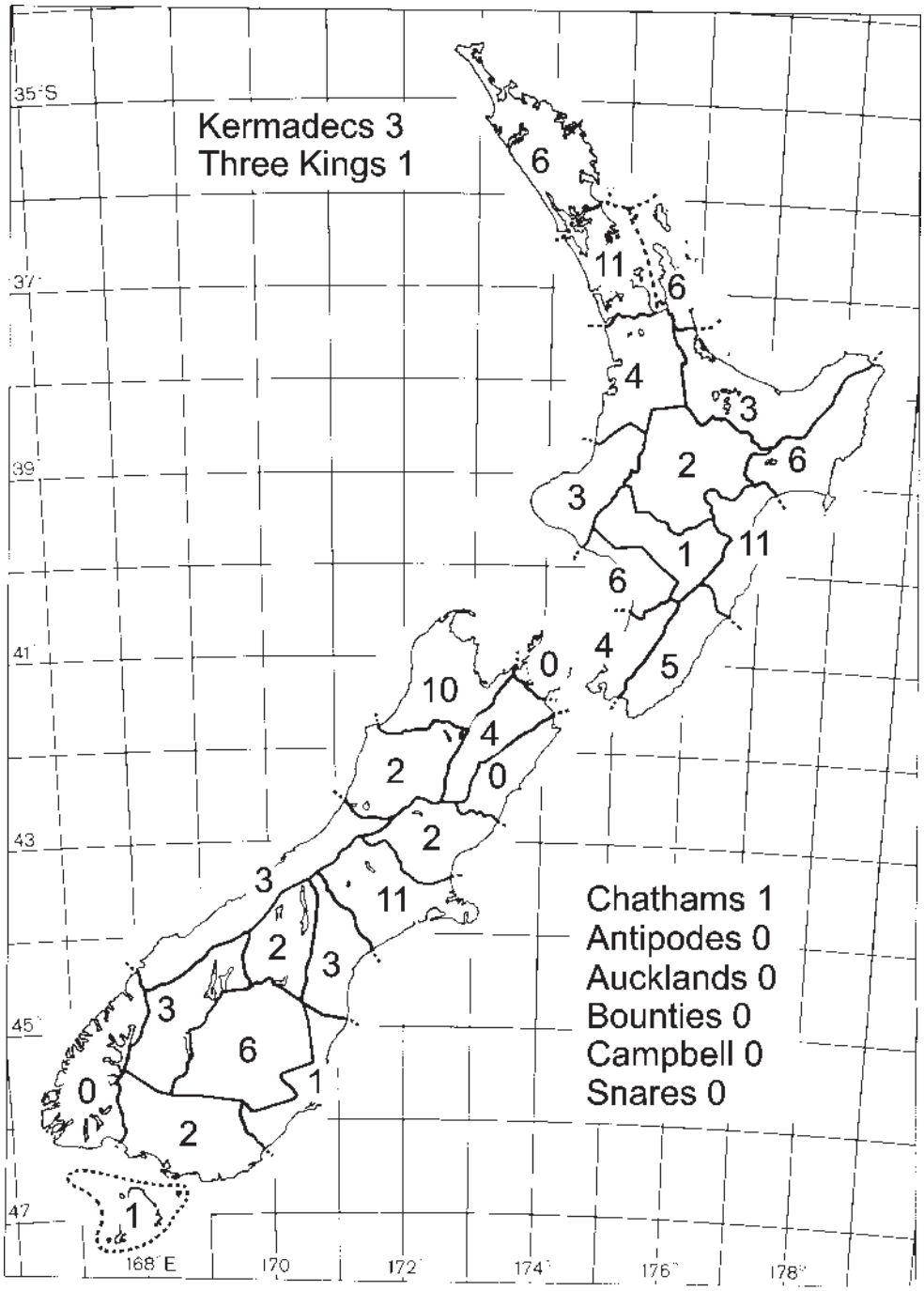
Map 4. Total number of species-group taxa by areas.



Map 5. Number of known New Zealand endemic species-group taxa by areas.

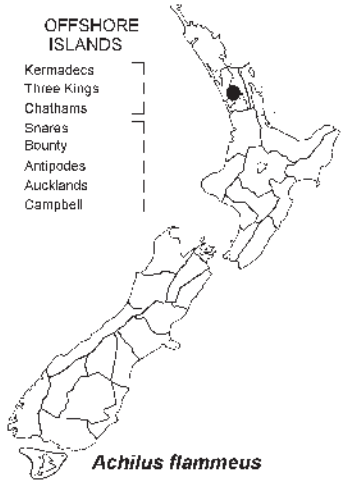


Map 6. Number of New Zealand endemic species-group taxa known to be restricted to single areas.

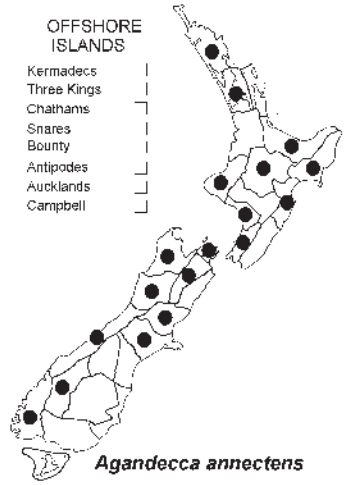


Map 7. Number of known adventive species-group taxa by areas.

ACHILIDAE

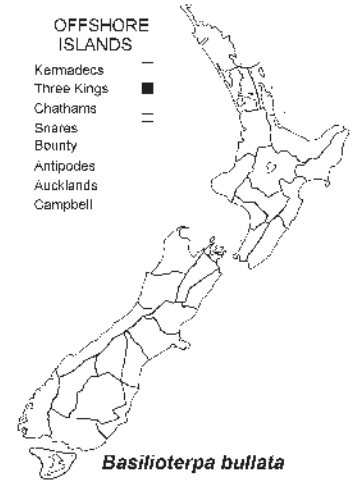


Achilus flammeus

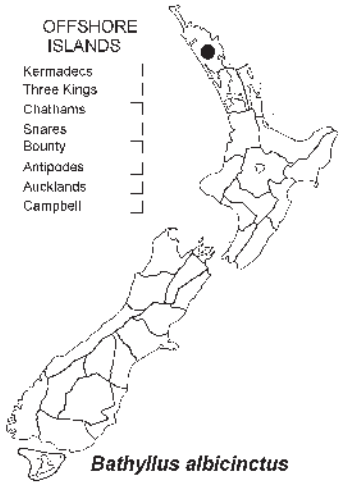


Agandecca annectens

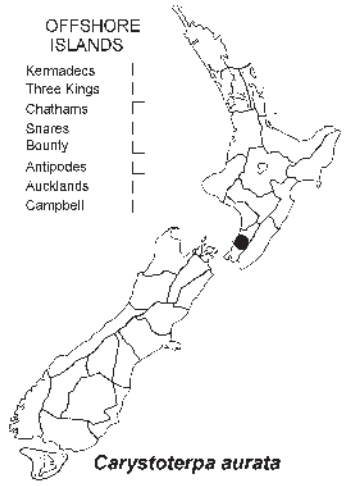
APHROPHORIDAE



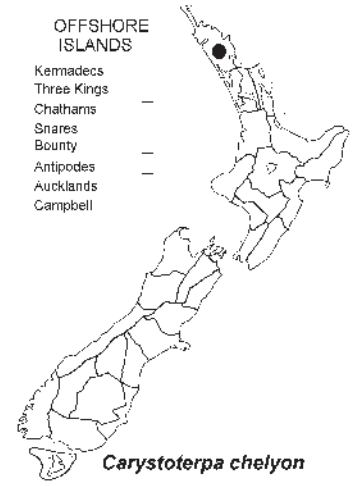
Basilioterpa bullata



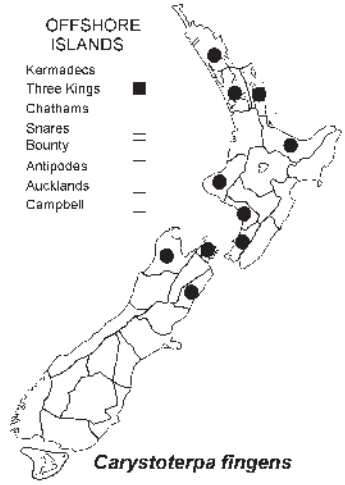
Bathyllus albicinctus



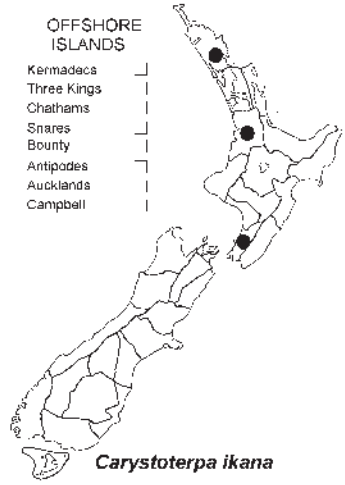
Carystoterpa aurata



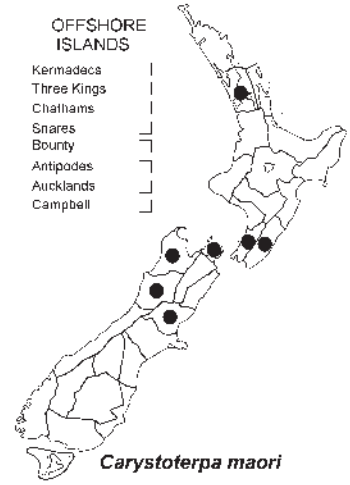
Carystoterpa chelyon



Carystoterpa fingens



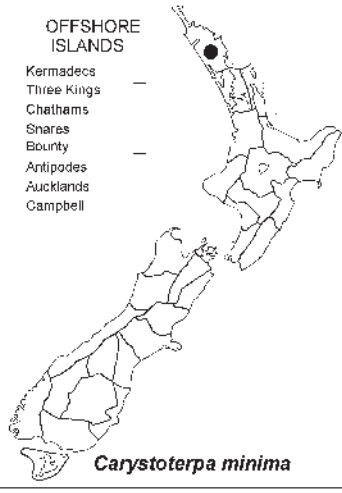
Carystoterpa ikana



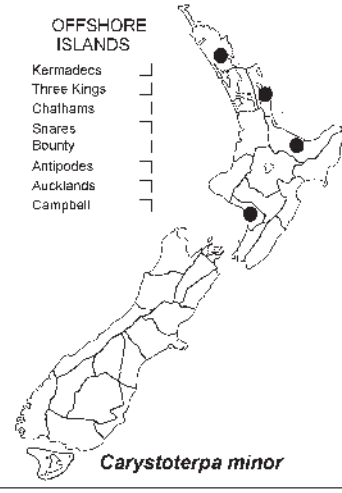
Carystoterpa maori

Species distribution maps (pp. 199–221). Presented alphabetically by families, genera and species. Area boundaries follow area codes of Crosby *et al*. (1976, 1998).

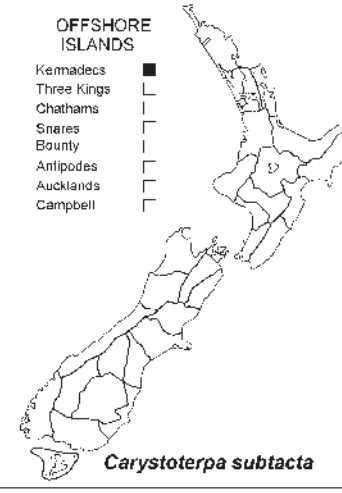
APHROPHORIDAE



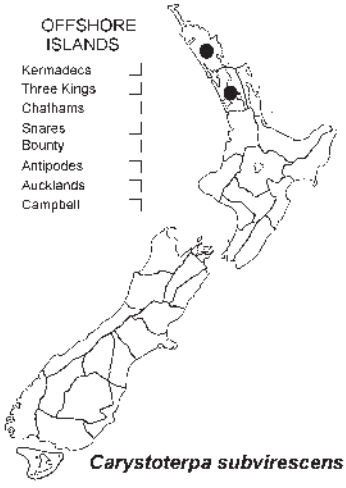
Carystoterpa minima



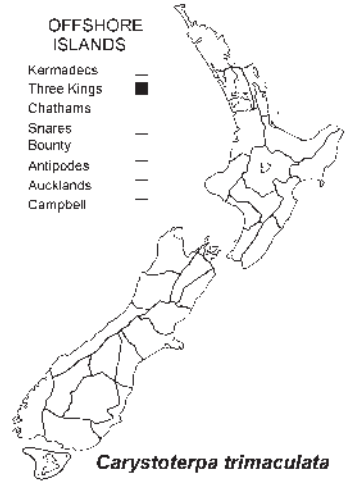
Carystoterpa minor



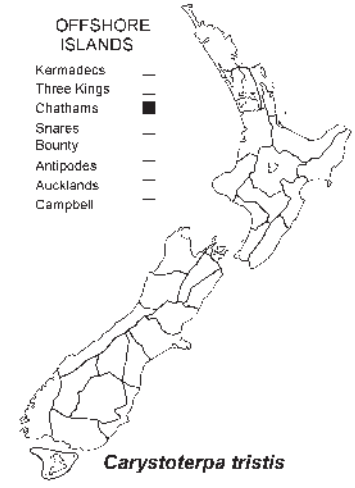
Carystoterpa subtacta



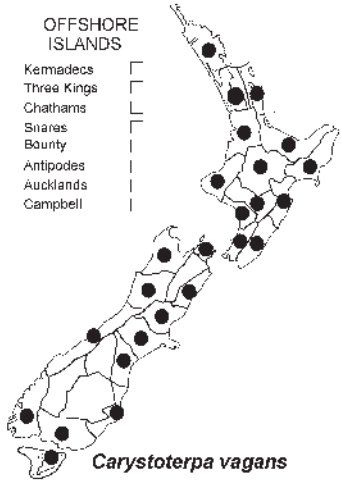
Carystoterpa subvirescens



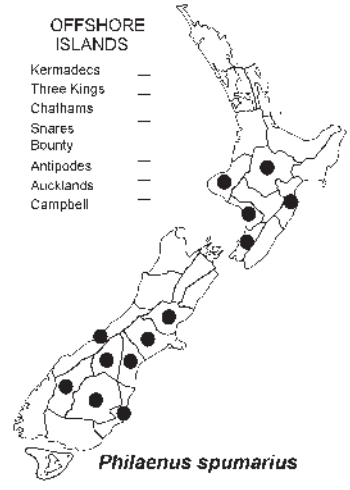
Carystoterpa trimaculata



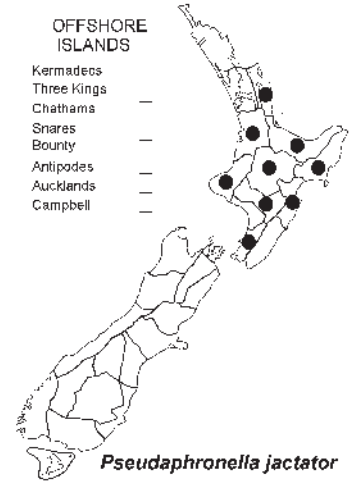
Carystoterpa tristis



Carystoterpa vagans

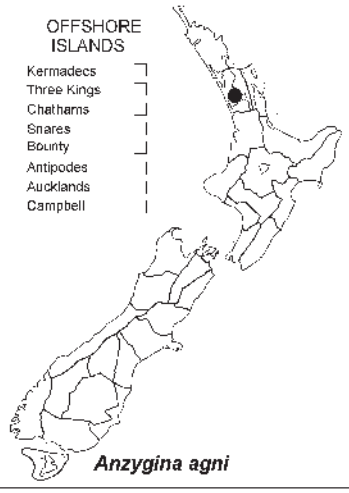


Philaenus spumarius

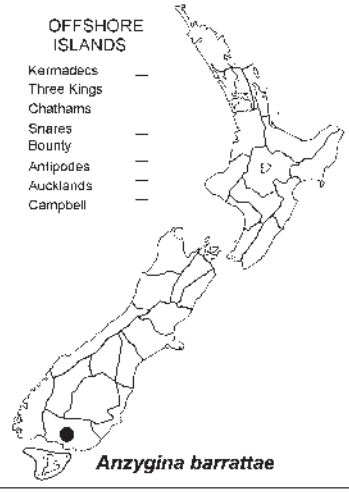


Pseudaphronella jactator

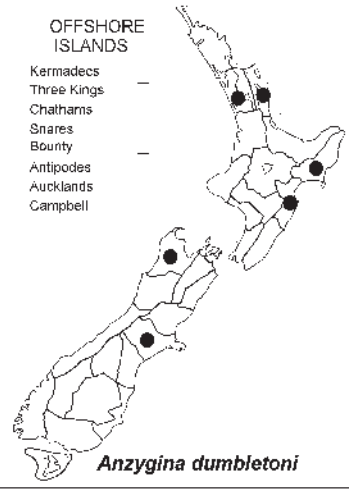
CICADELLIDAE



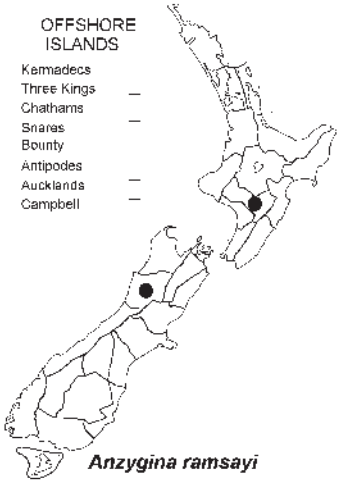
Anzygina agni



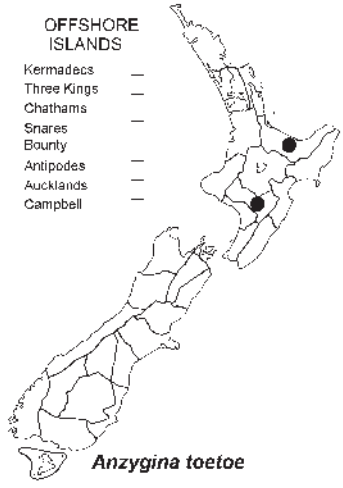
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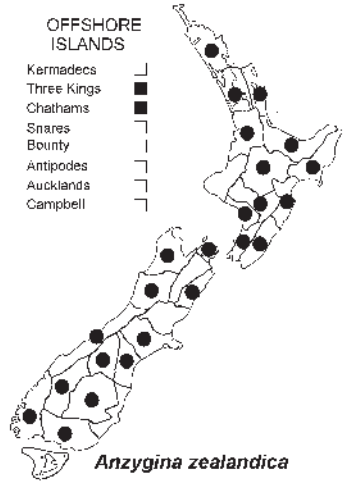
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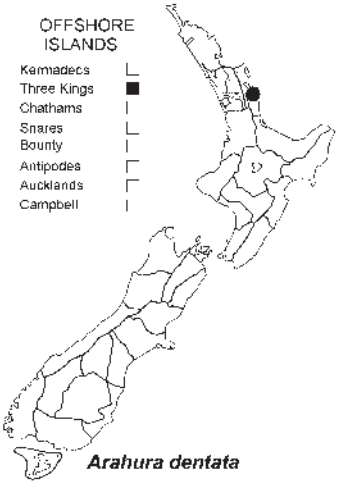
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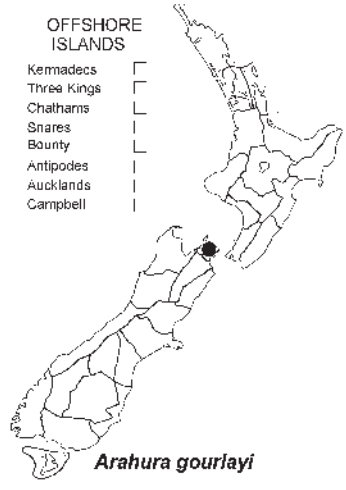
Anzygina toetoe



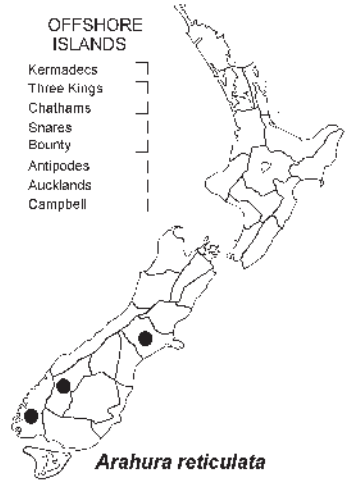
Anzygina zealandica



Arahura dentata

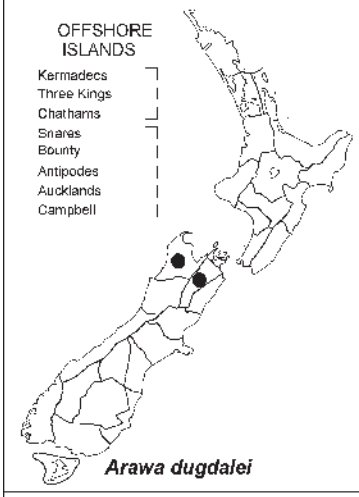


Arahura gourlayi

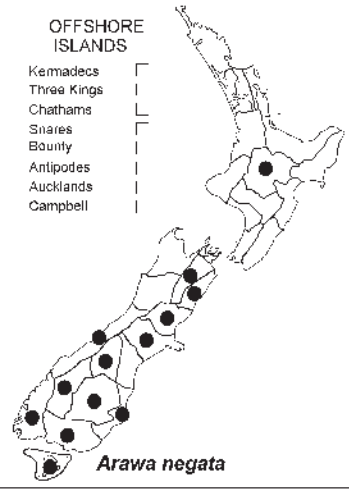


Arahura reticulata

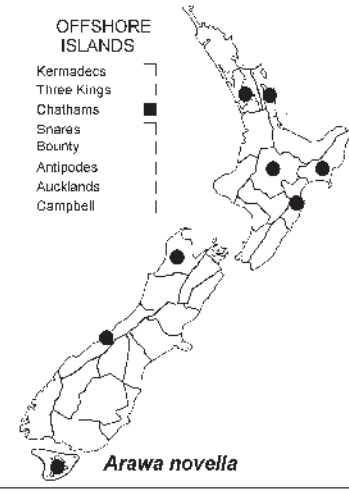
CICADELLIDAE



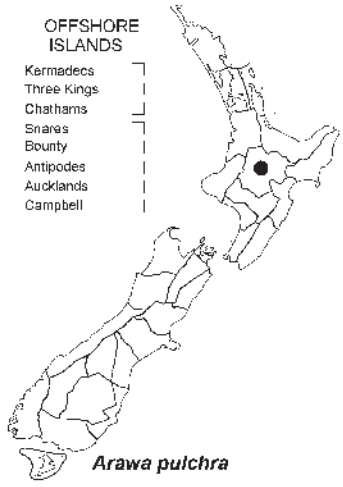
Arawa dugdalei



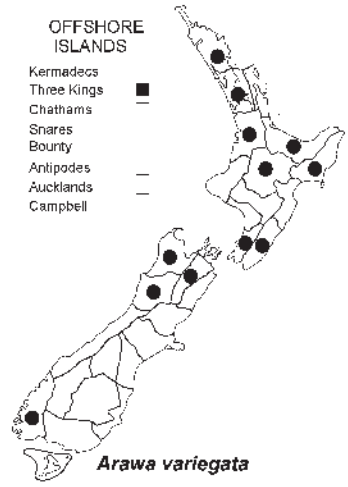
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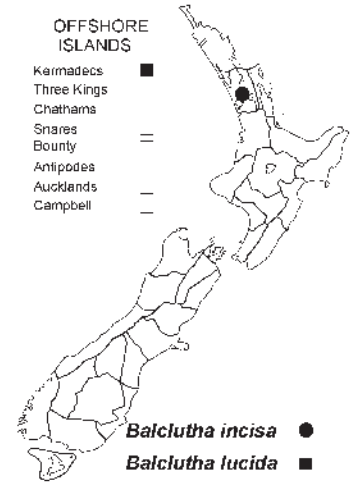
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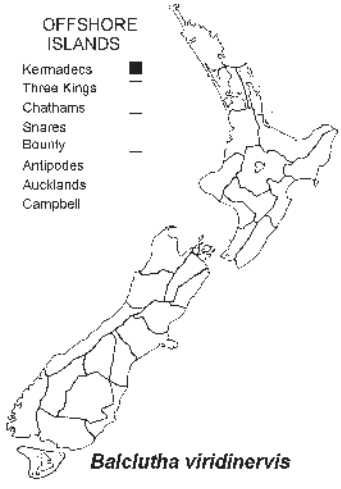
Arawa pulchra



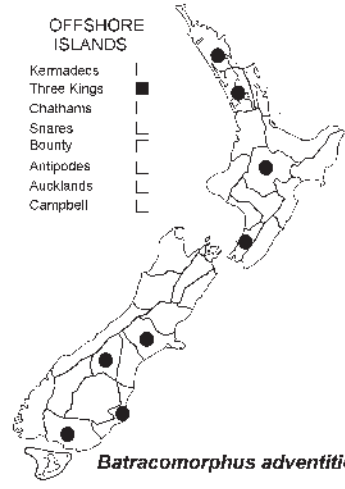
Arawa variegata



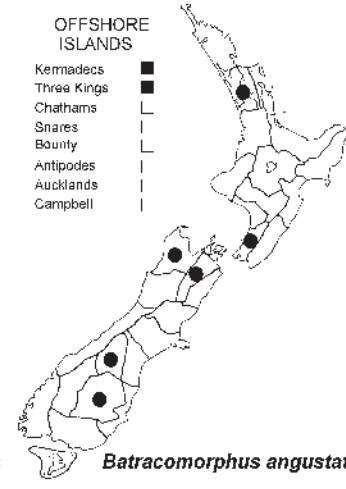
Balclutha incisa ●
Balclutha lucida ■



Balclutha viridinervis

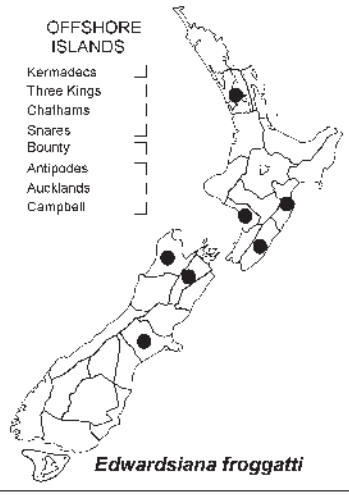


Batracomorphus adventitiosus

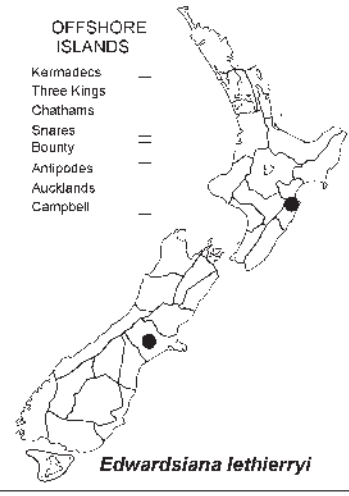


Batracomorphus angustatus

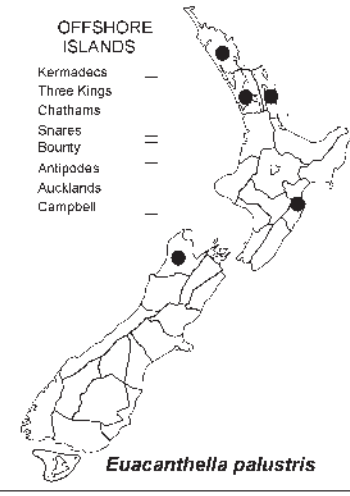
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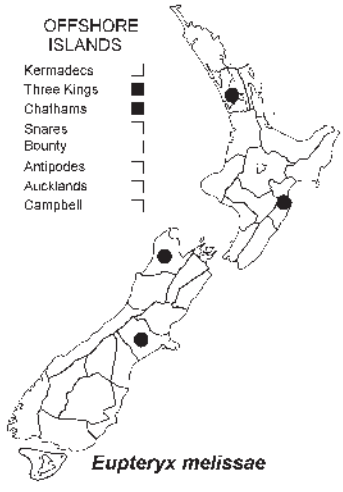
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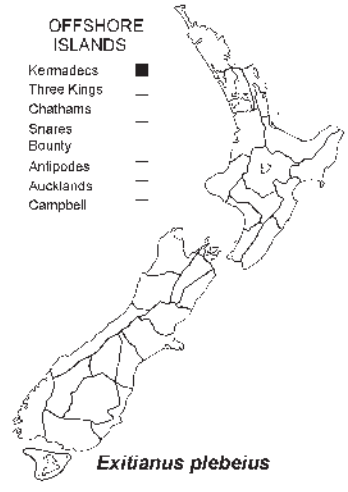
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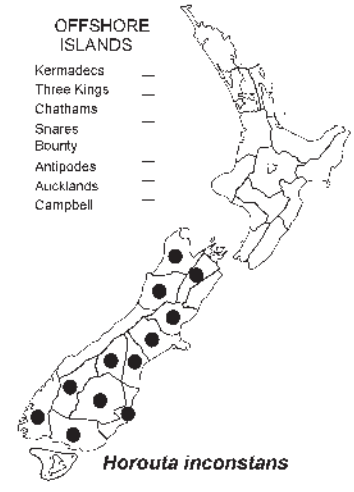
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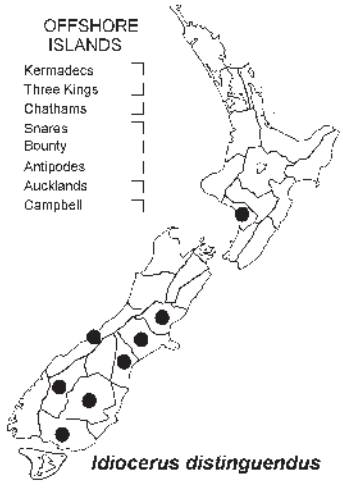
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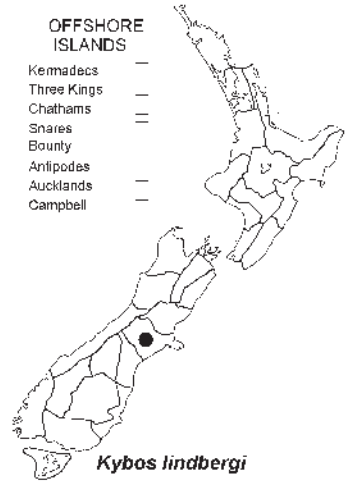
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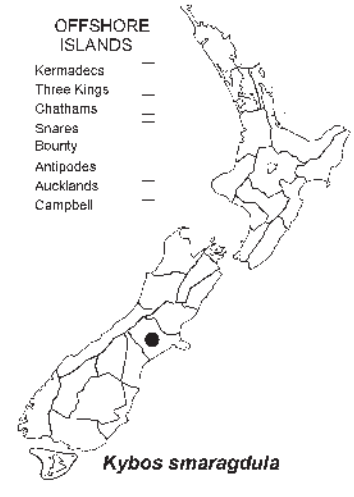
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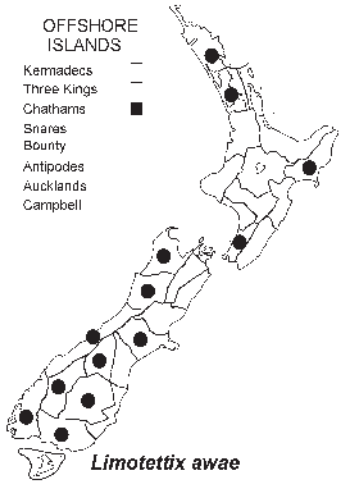


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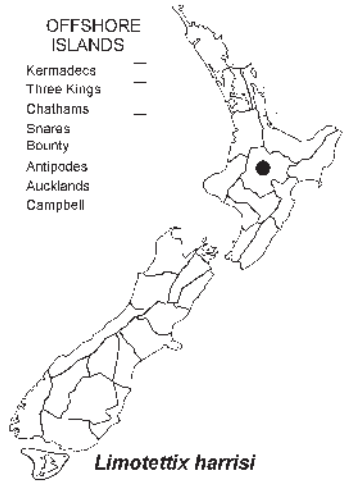


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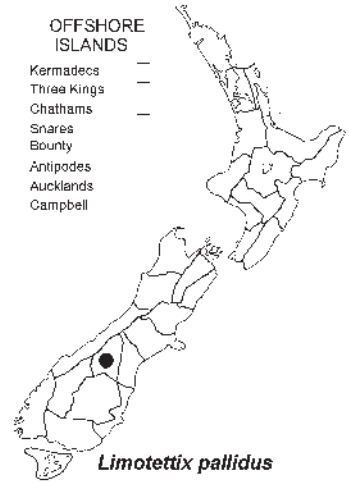
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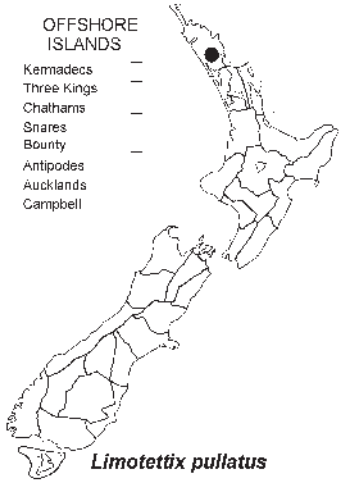
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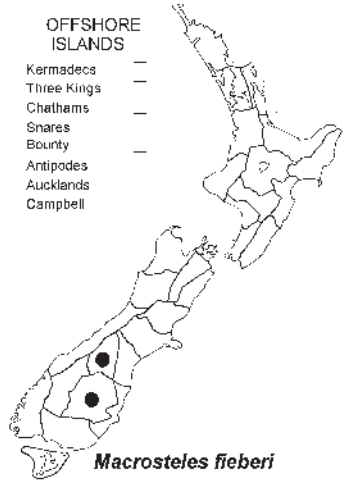
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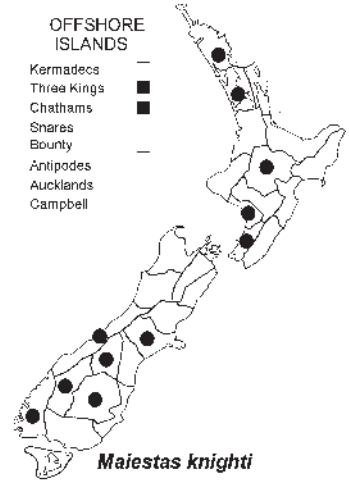
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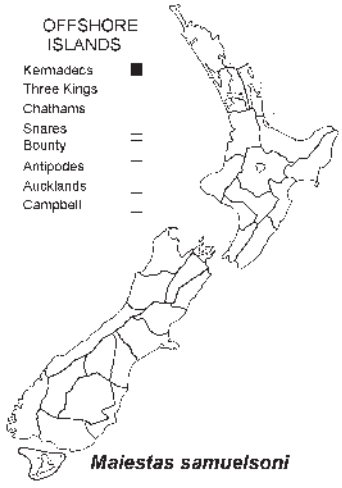
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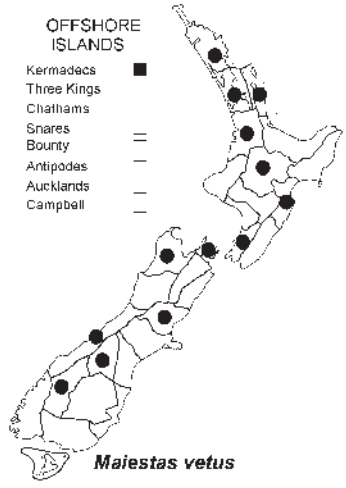
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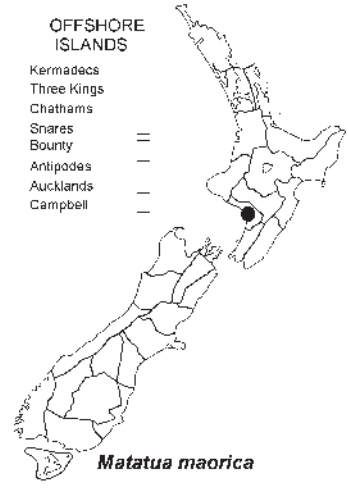
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Maiestas samuelsoni

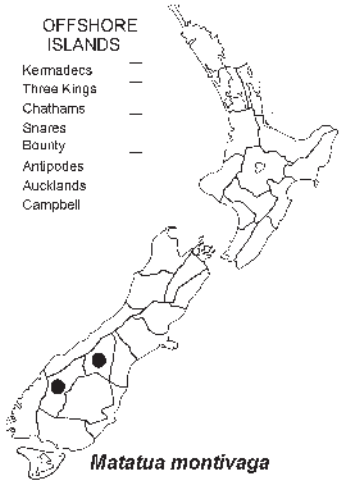


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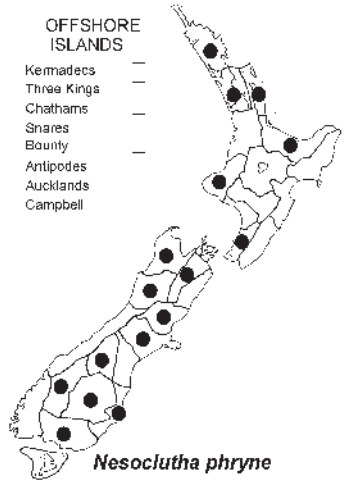


Matatua maorica

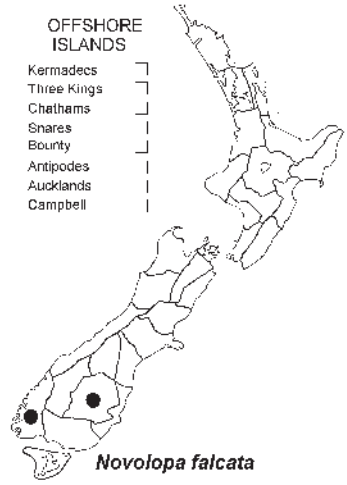
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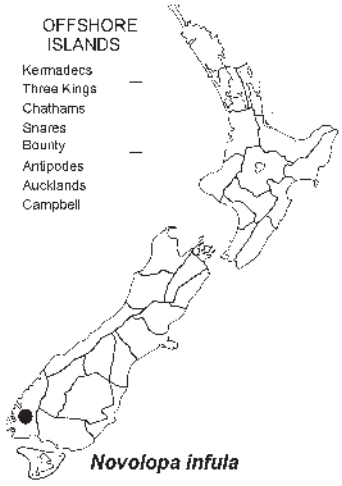
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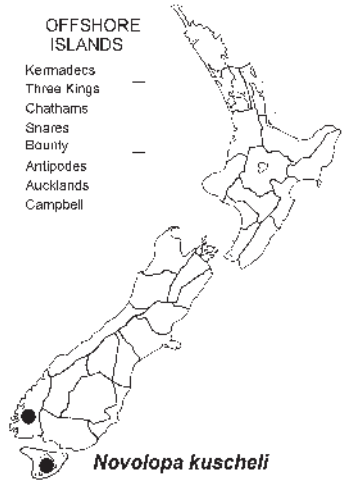
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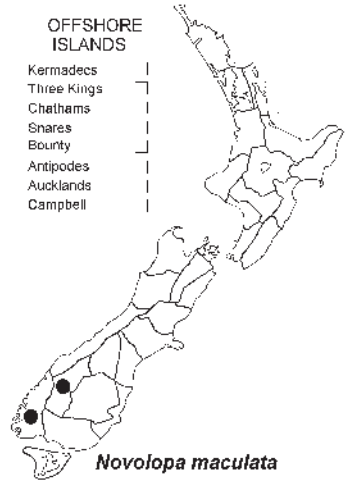
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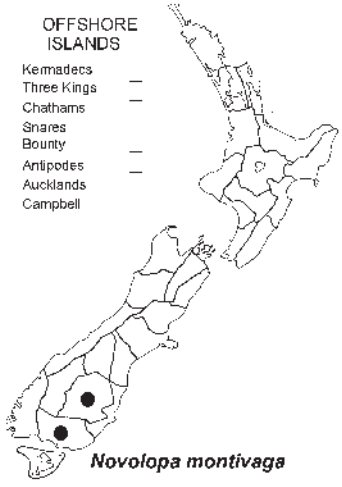
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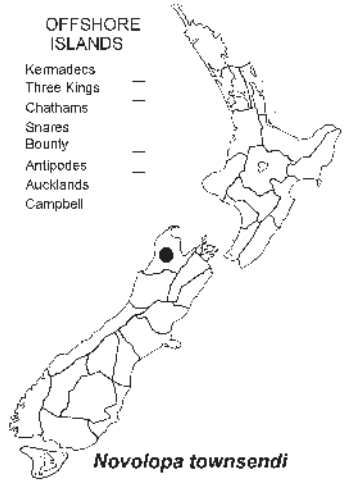
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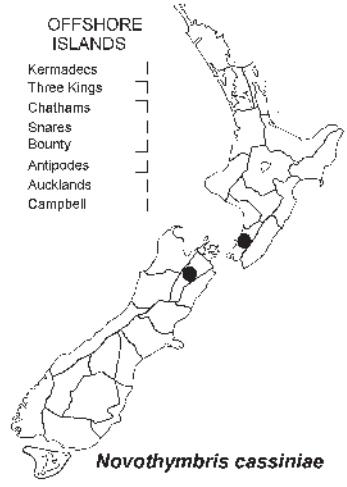
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Novolopa montivaga

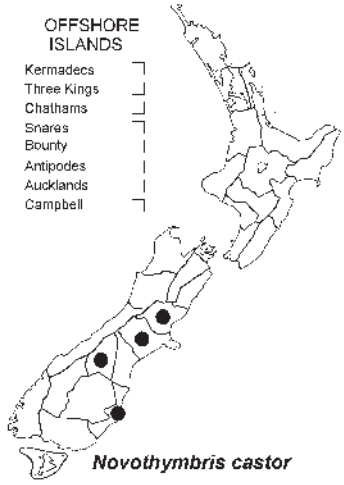


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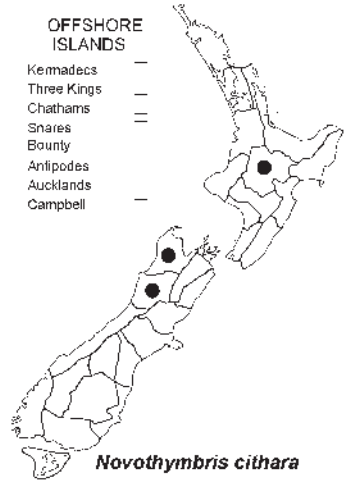


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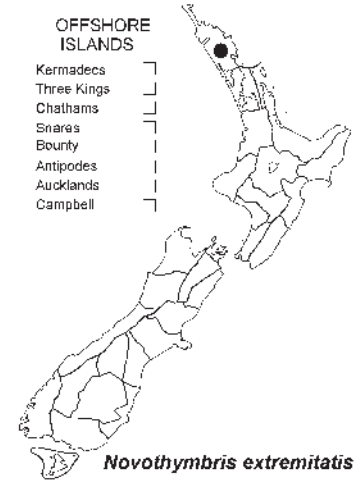
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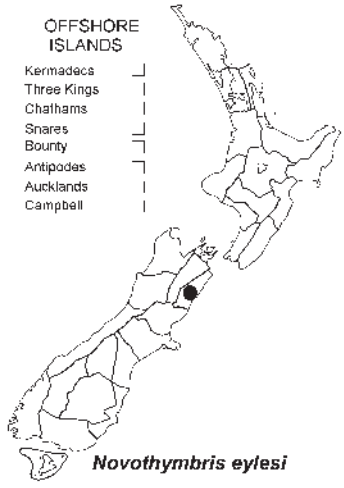
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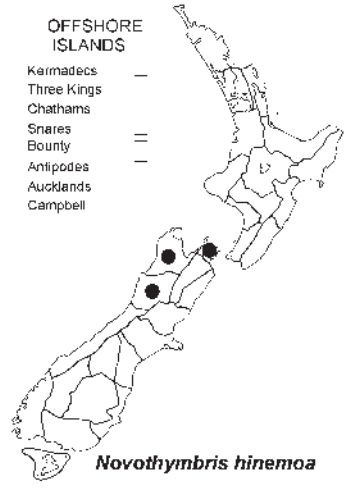
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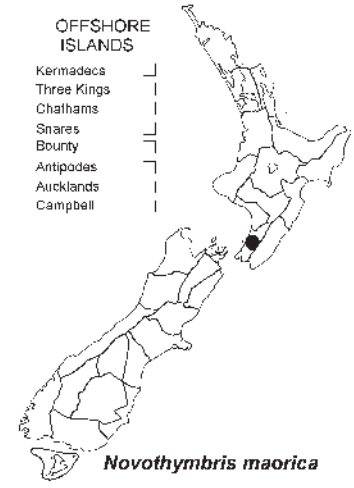
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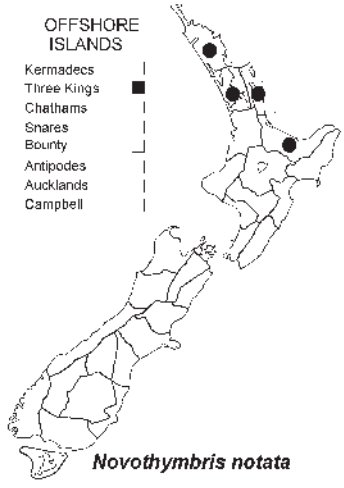
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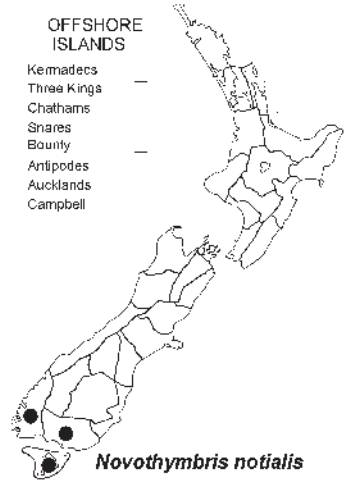
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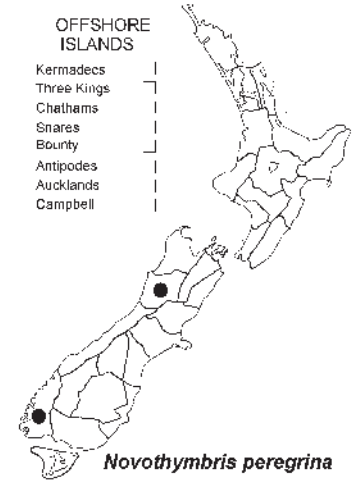
Novothymbris maorica



Novothymbris notata

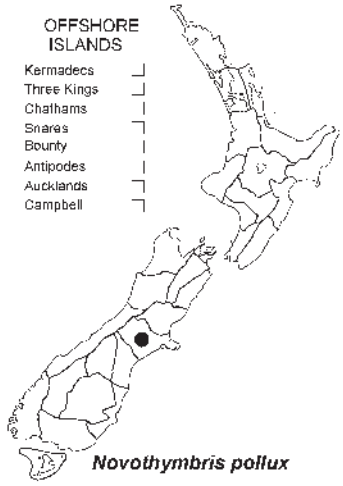


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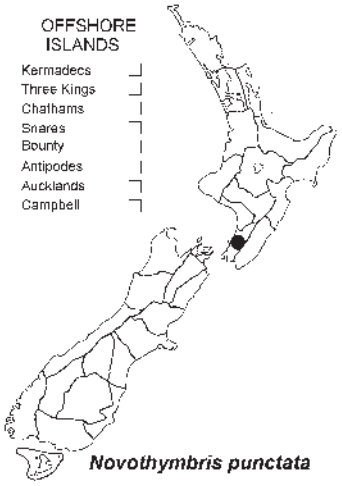


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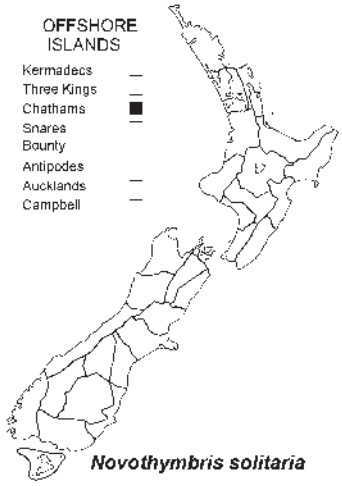
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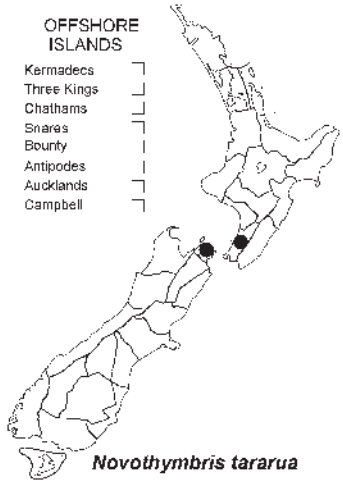
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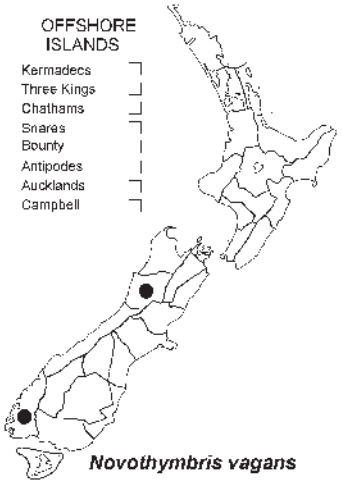
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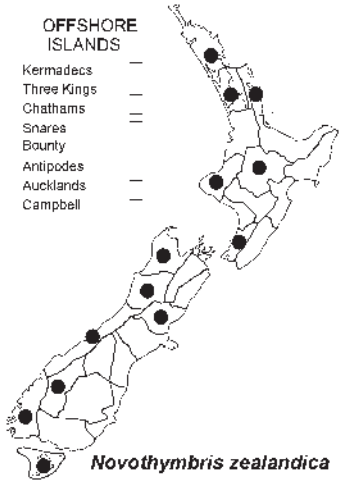
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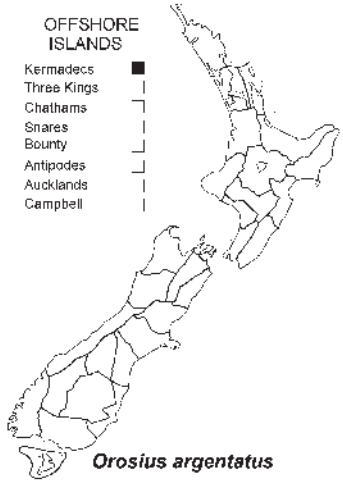
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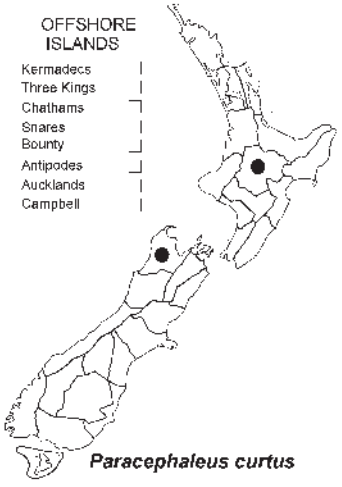
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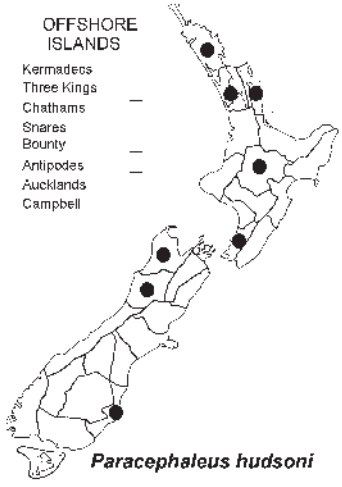
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Orosius argentatus

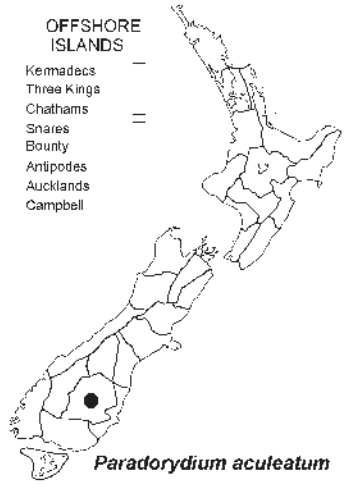


Paracephaleus curtus

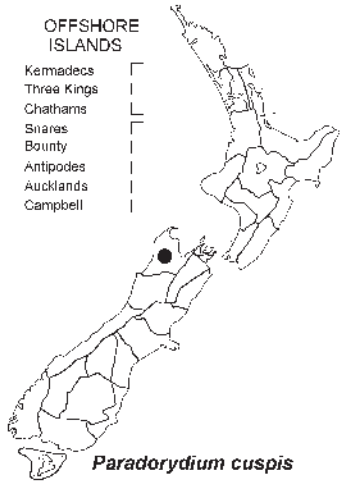


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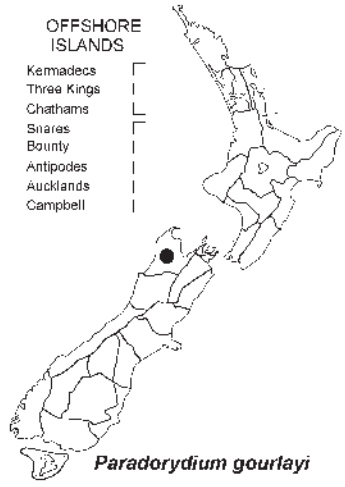
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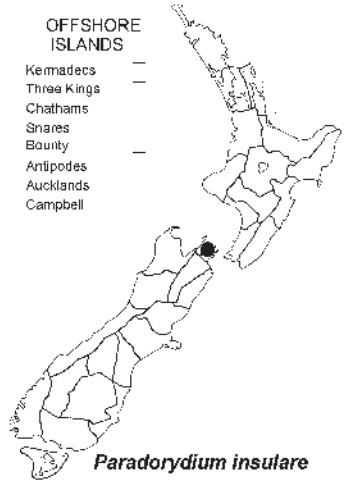
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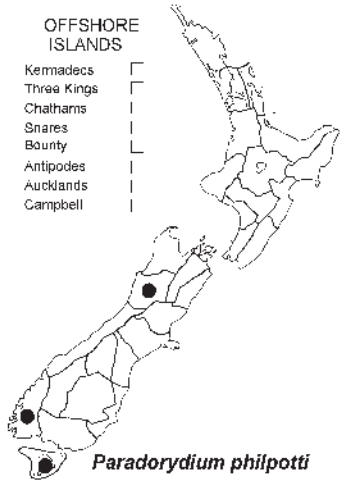
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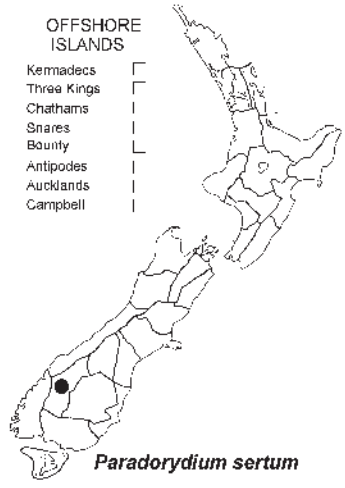
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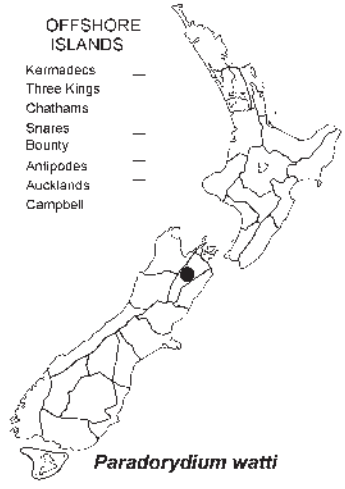
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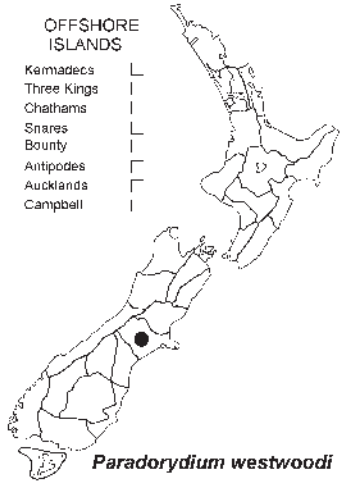
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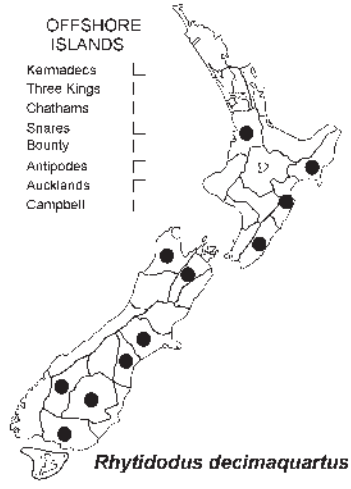
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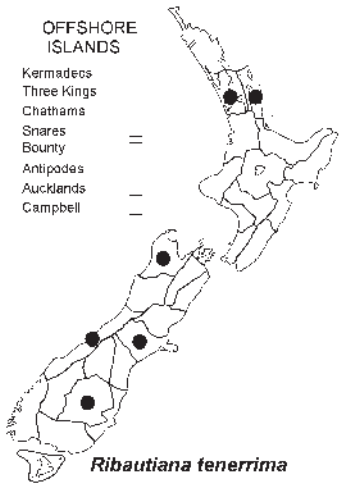


Paradorydium westwoodi

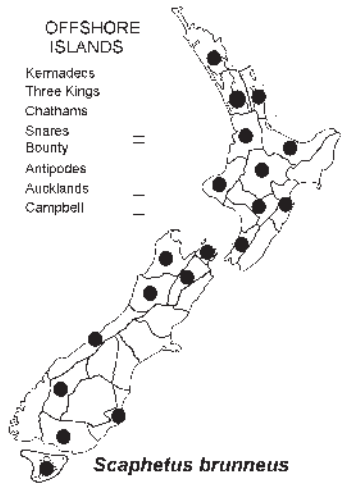


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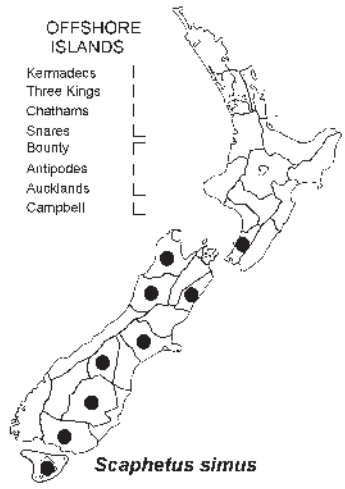
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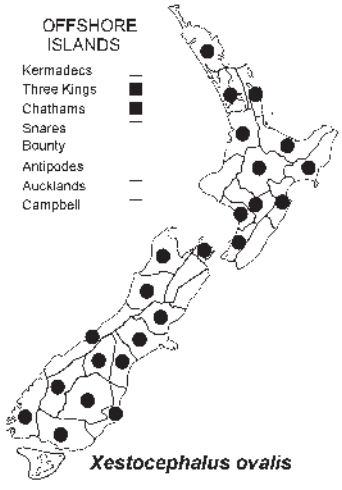


Scaphetus brunneus

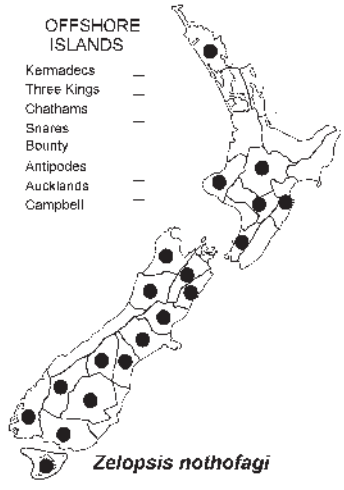


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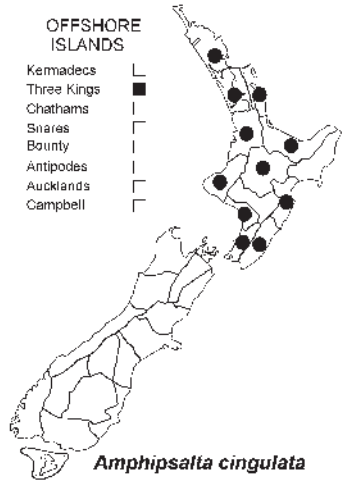
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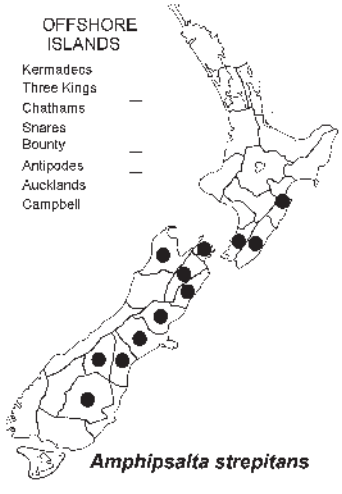
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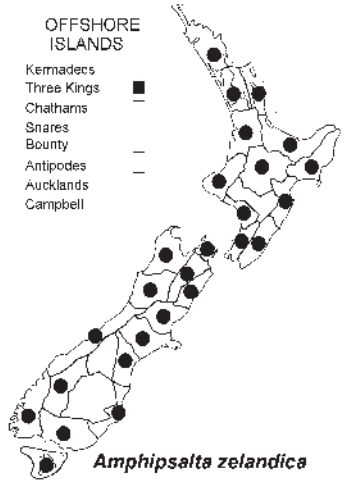
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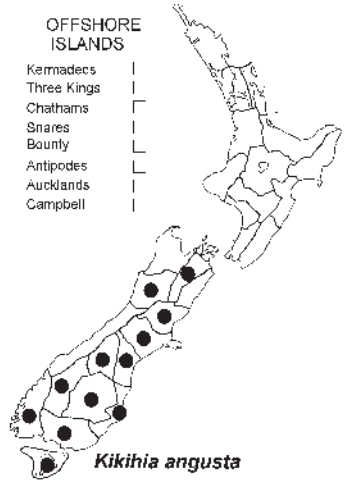
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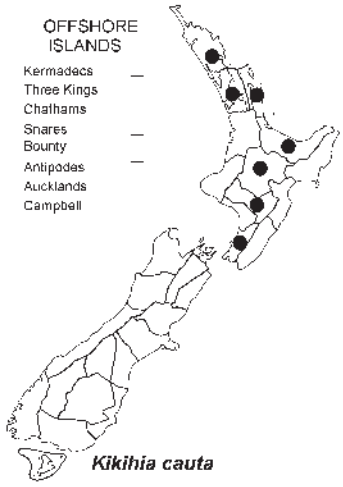


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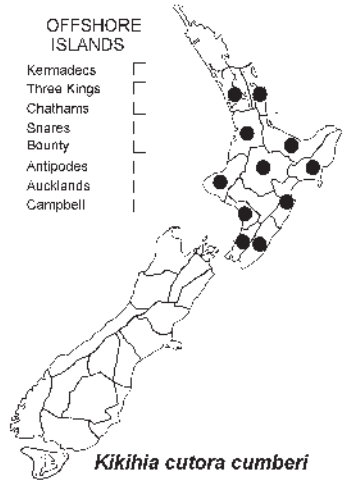


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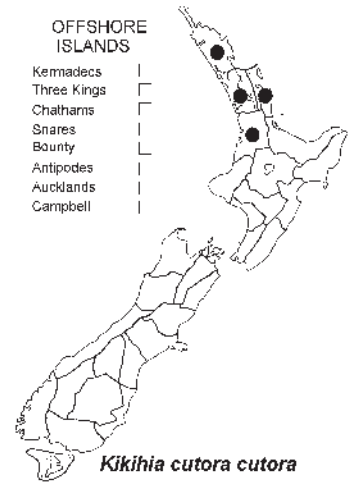
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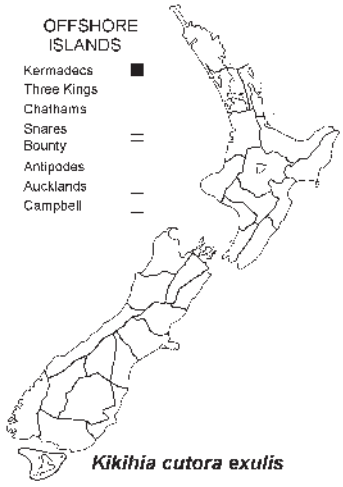
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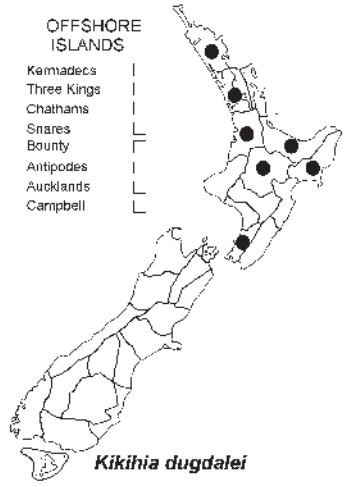
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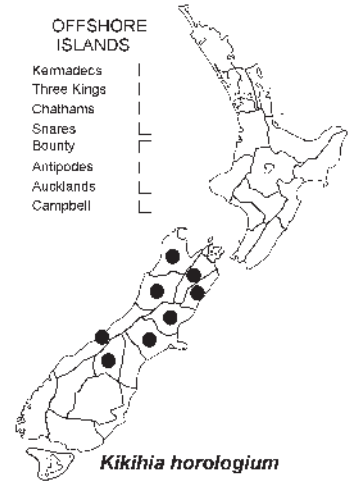
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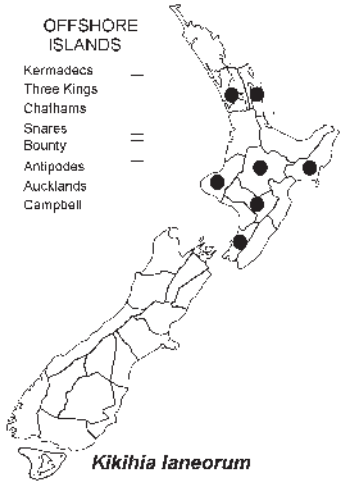
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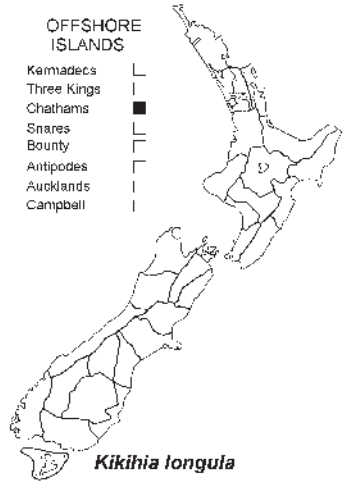
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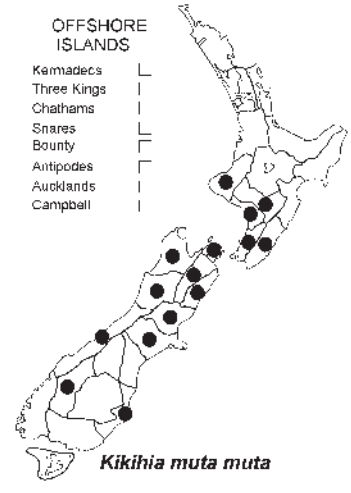
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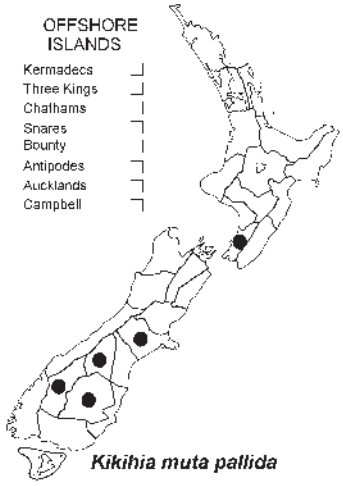


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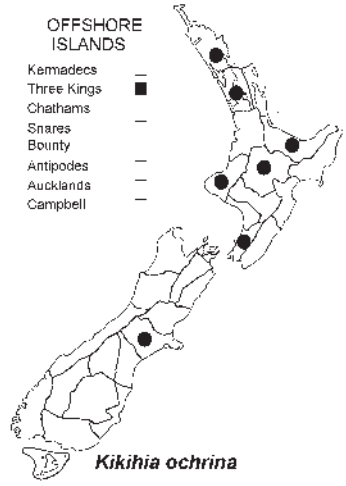


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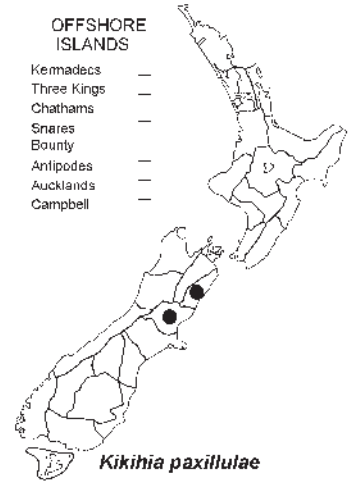
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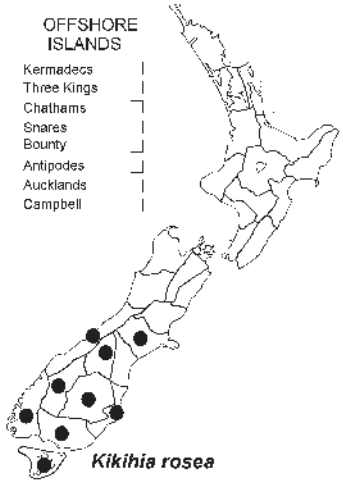
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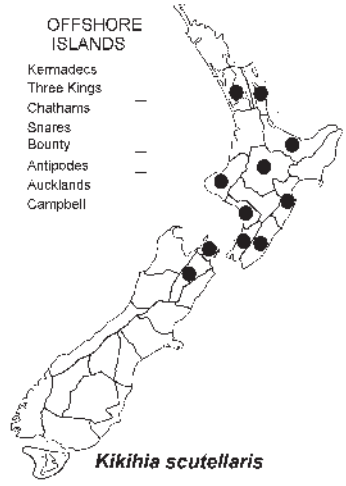
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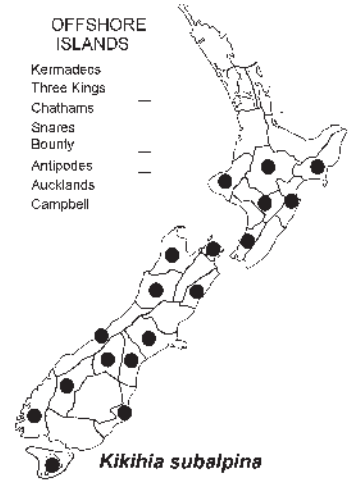
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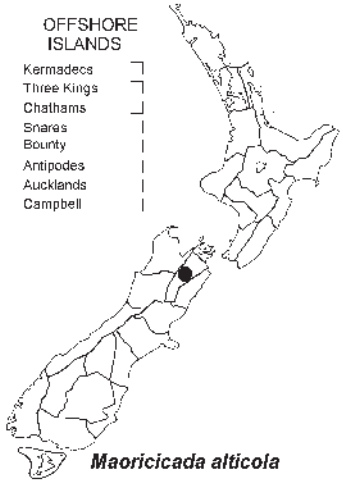
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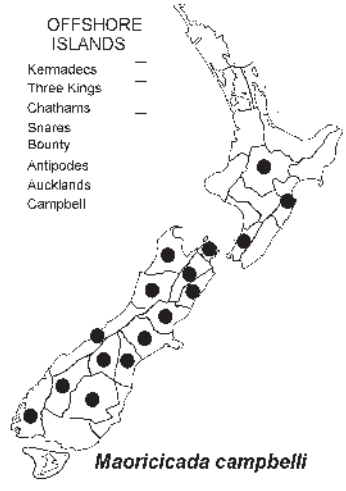
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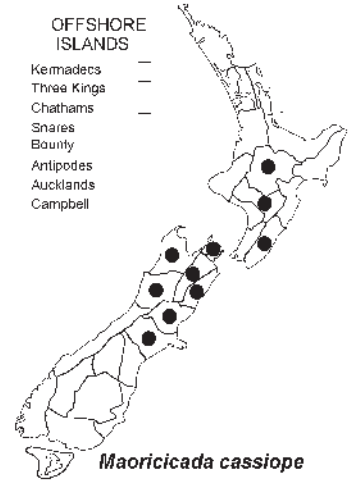
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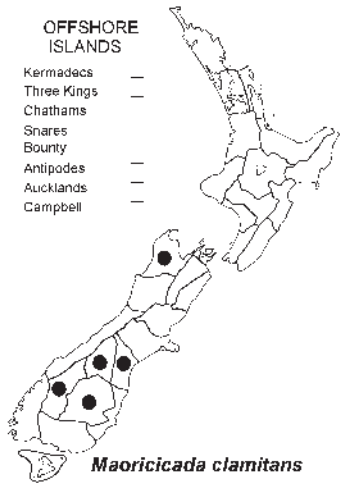


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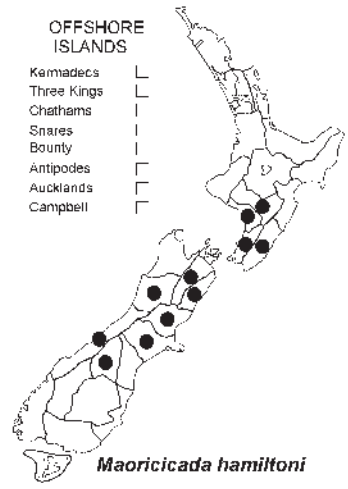


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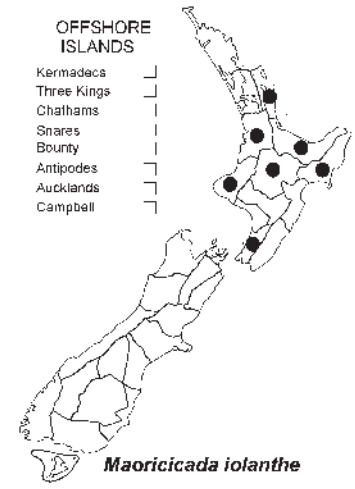
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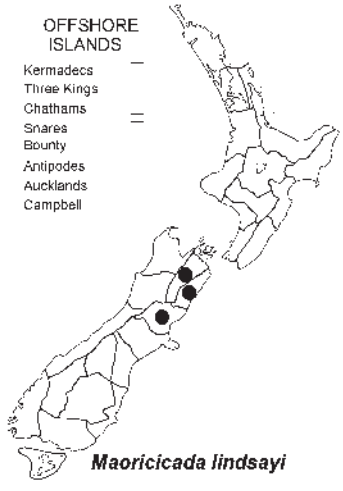
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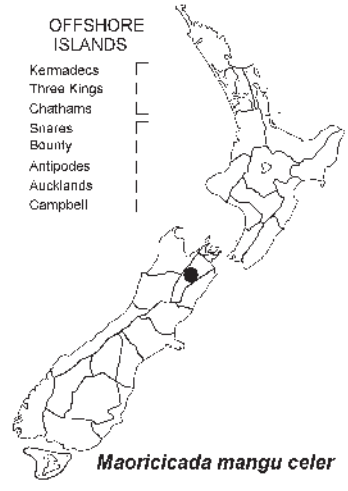
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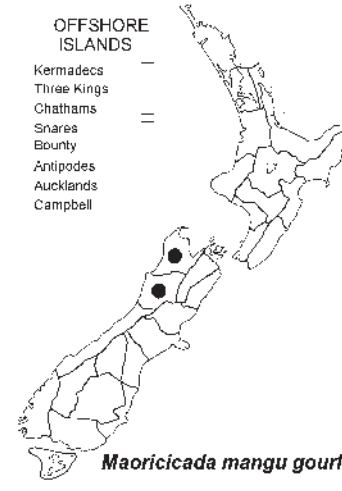
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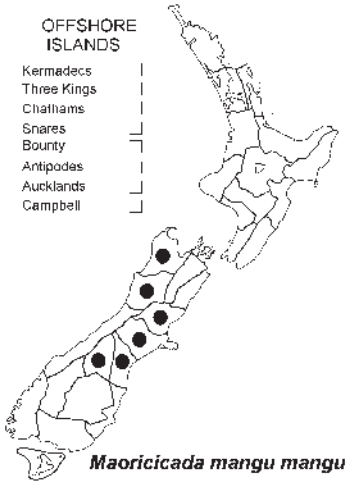
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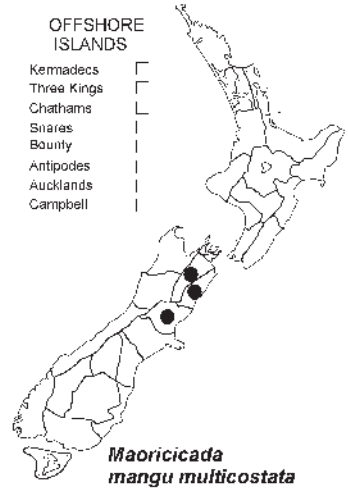
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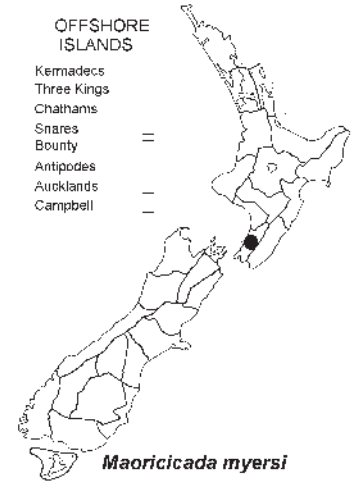
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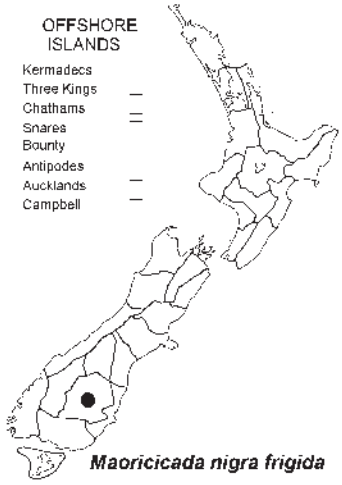


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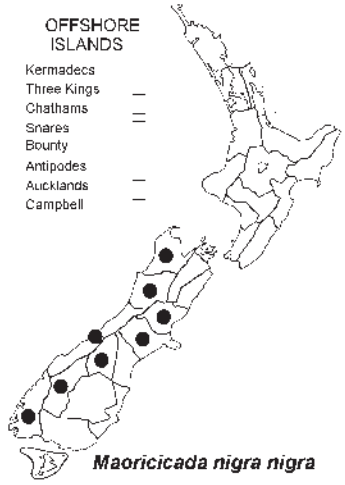


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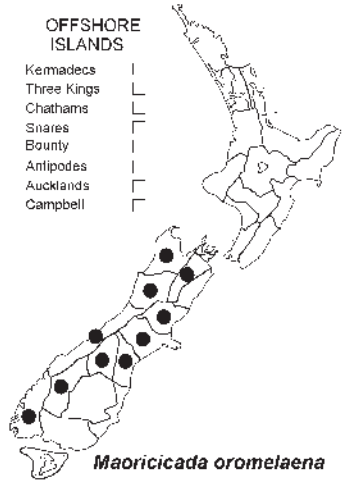
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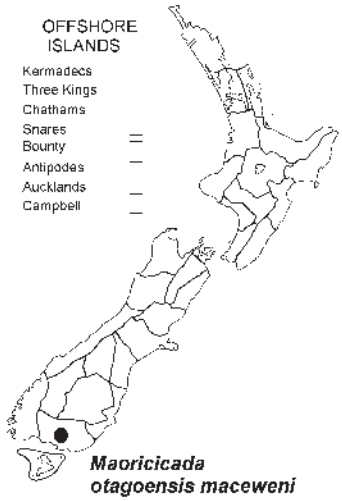
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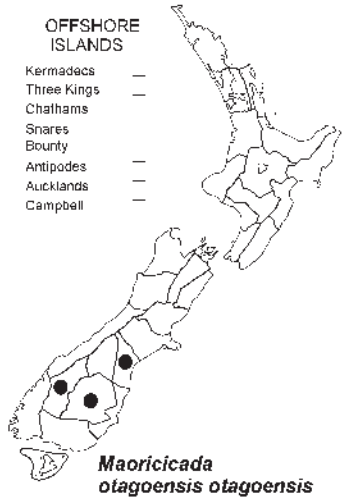
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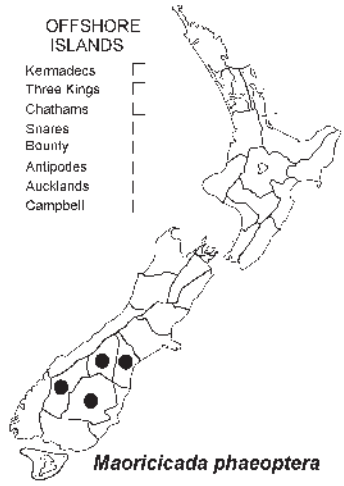
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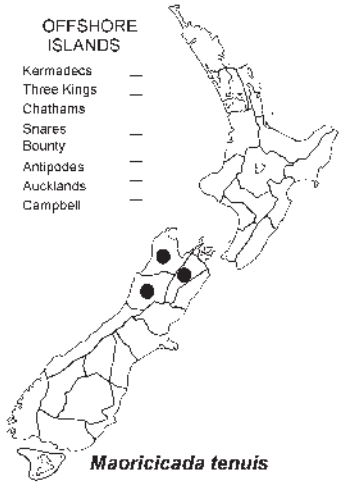
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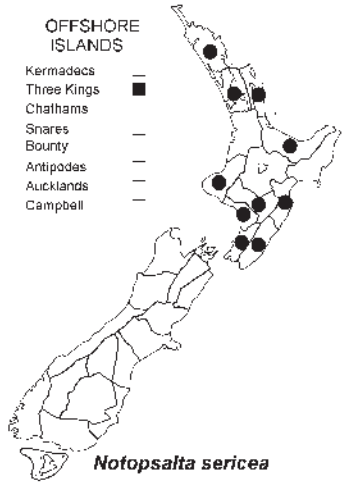
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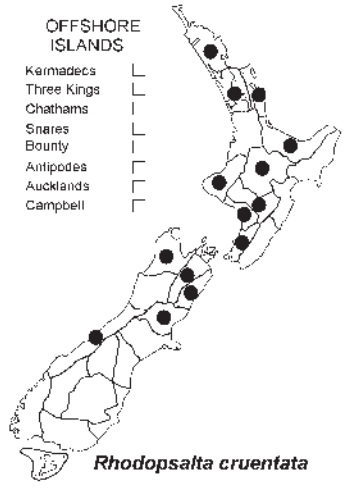
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Maoricicada tenuis



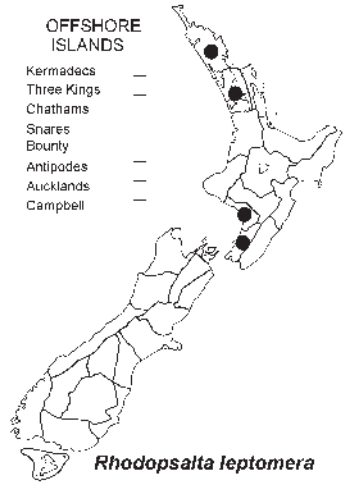
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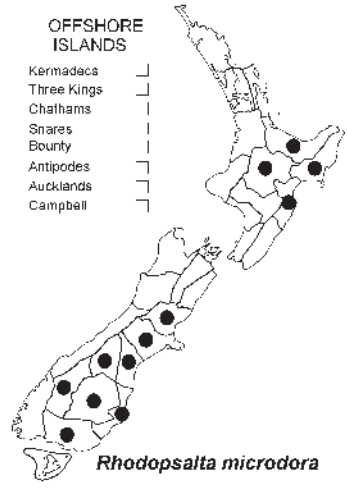
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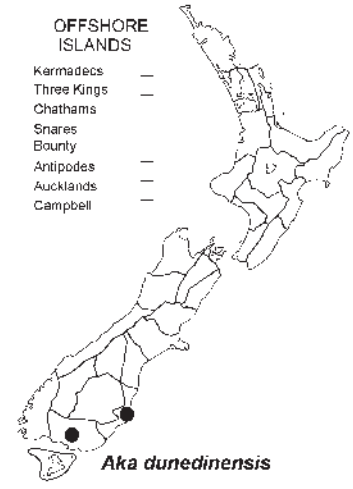
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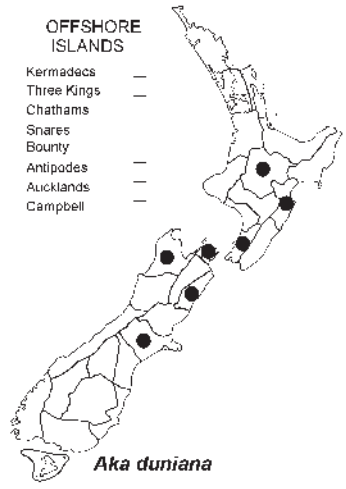
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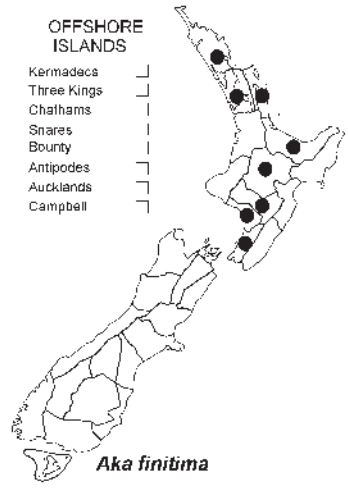
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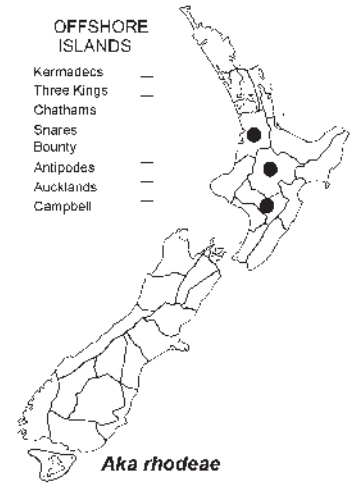
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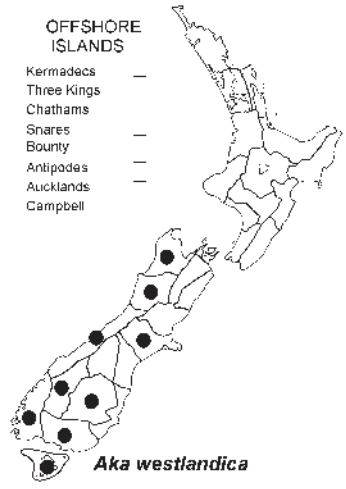
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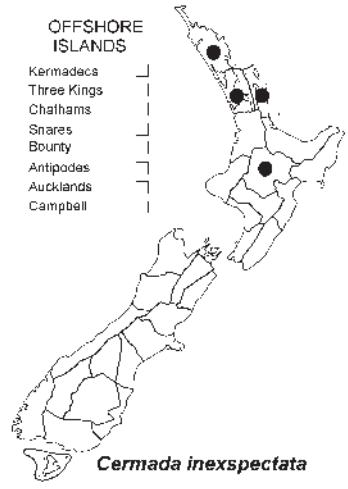
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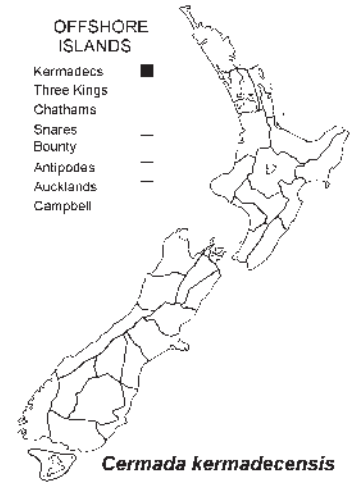
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Aka westlandica

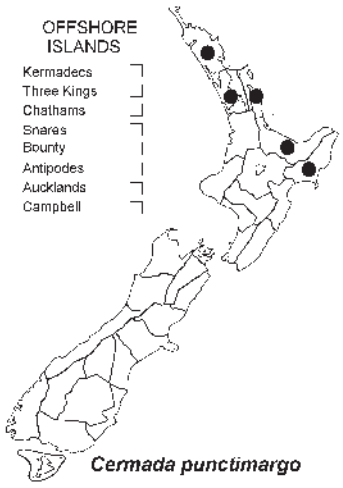


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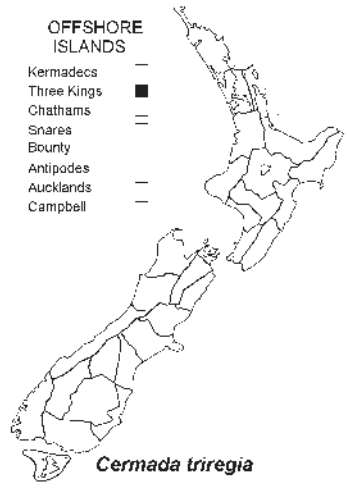


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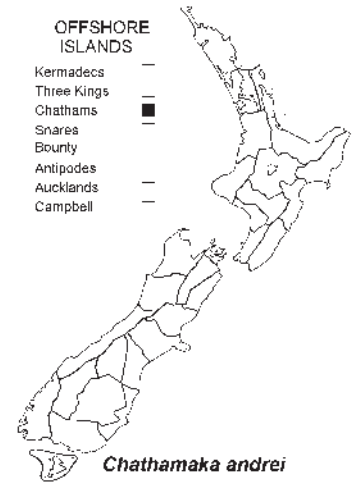
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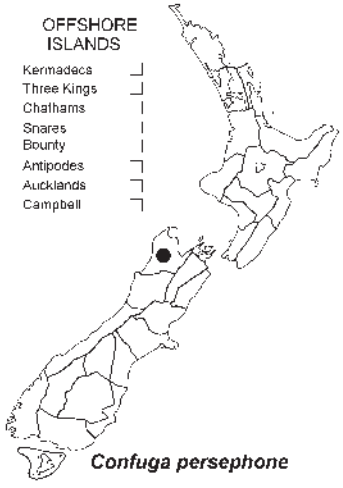
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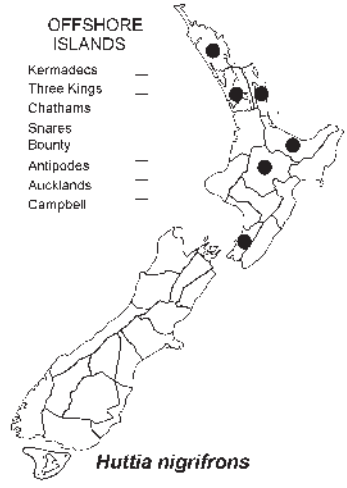
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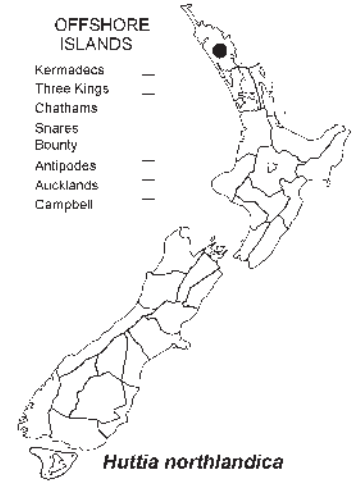
Chathamaka andrei



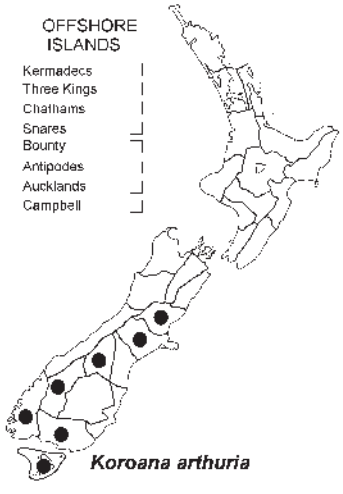
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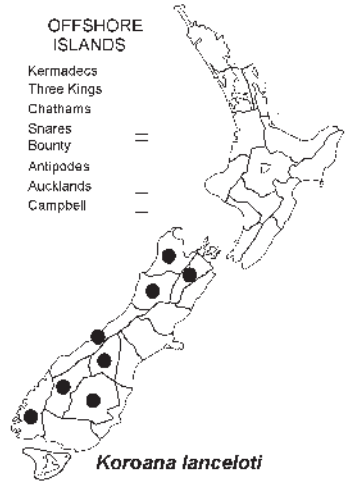
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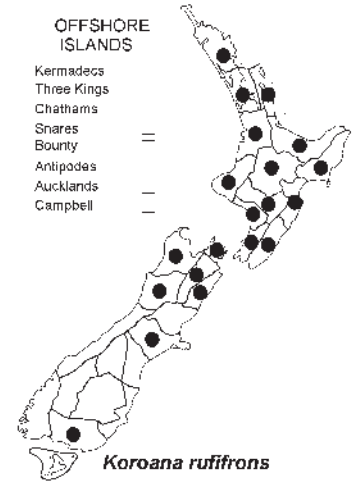
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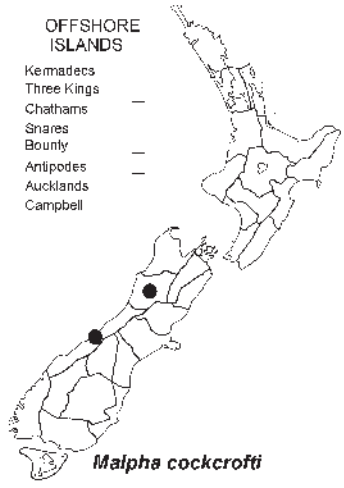


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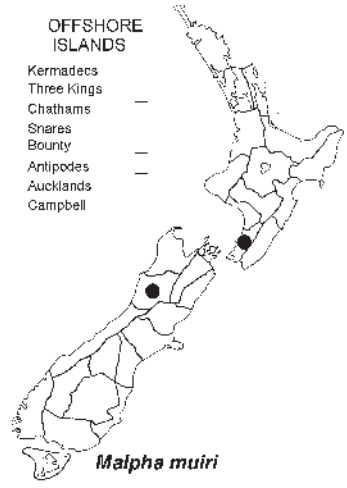


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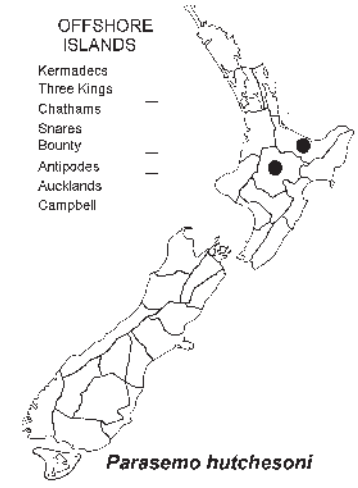
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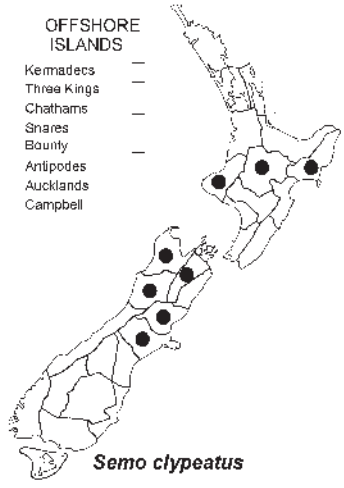
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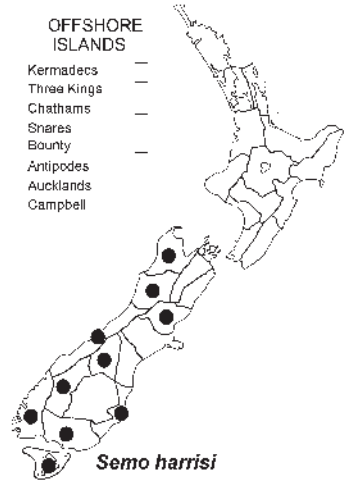
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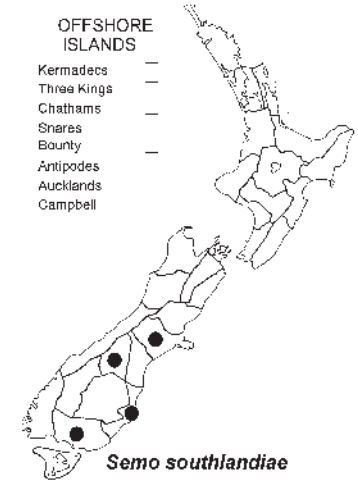
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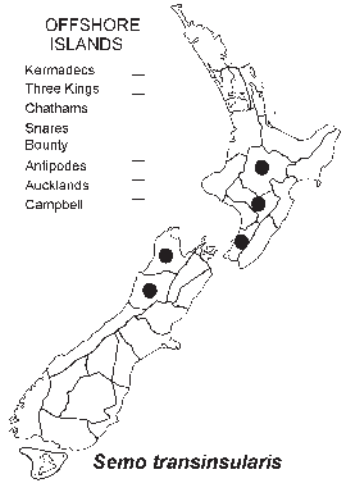
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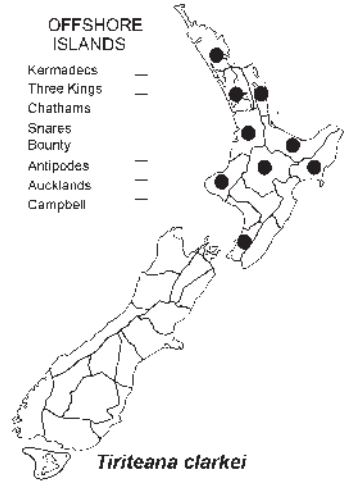
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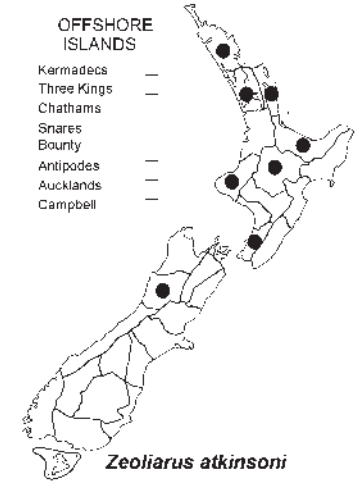
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Semo transinsularis

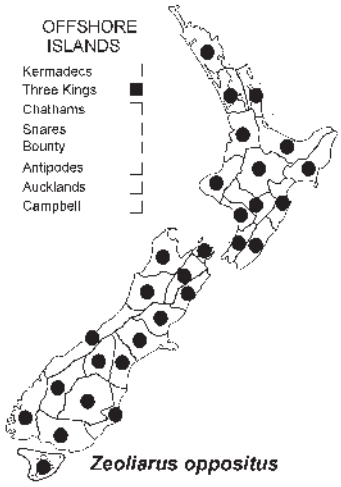


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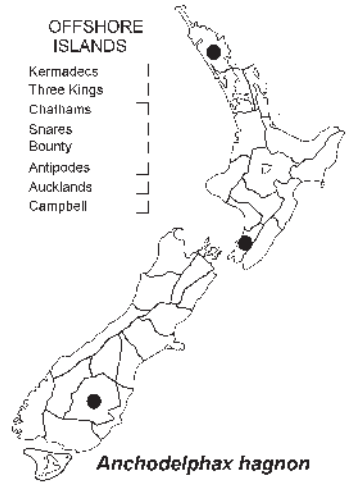
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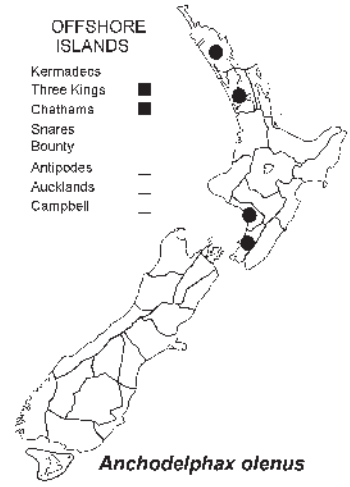


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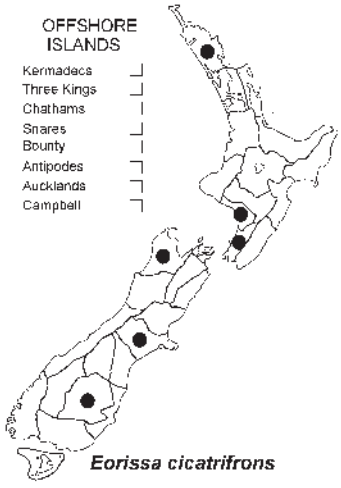
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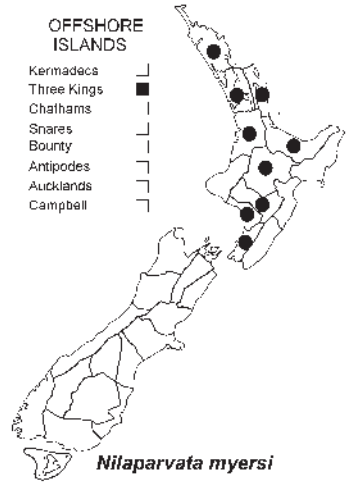
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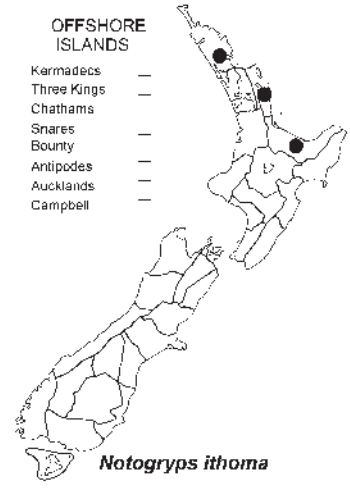
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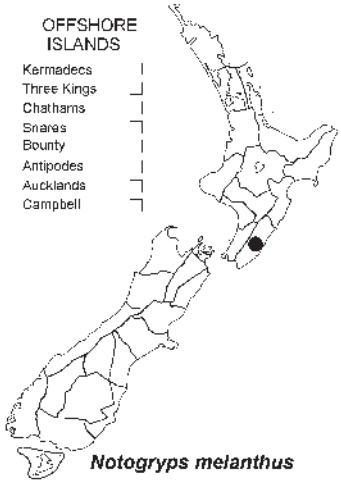
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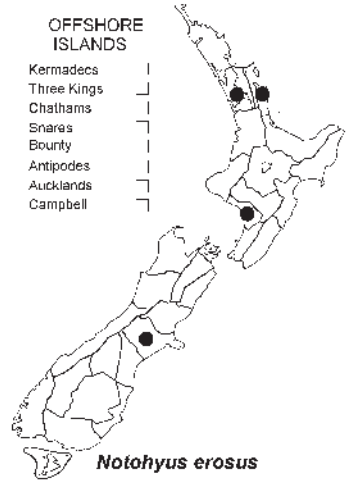
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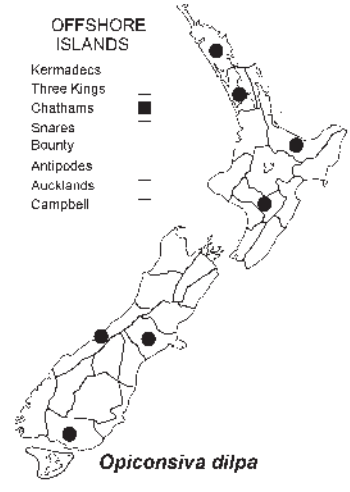
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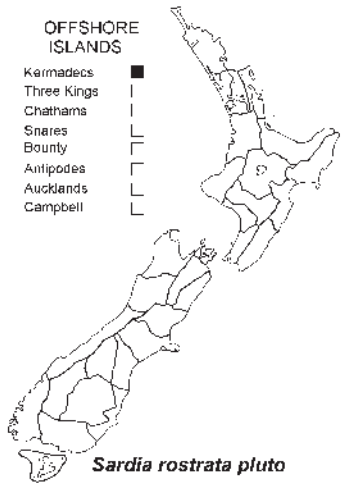


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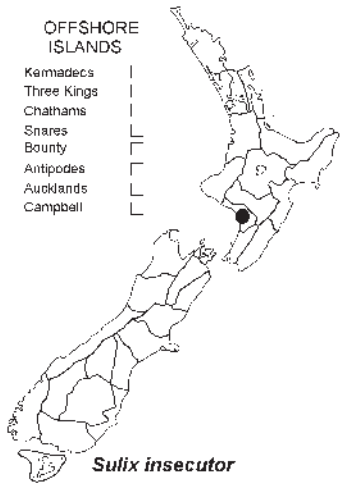


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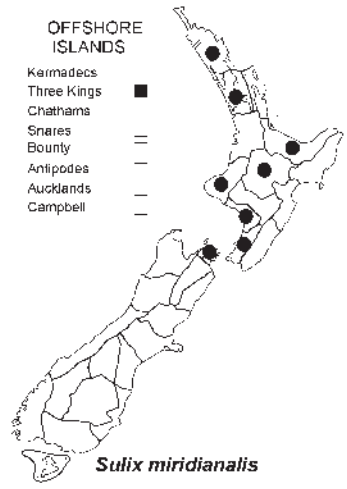
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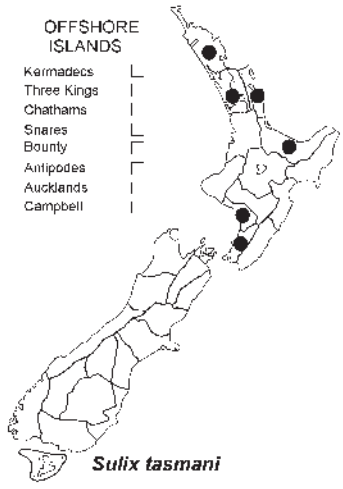
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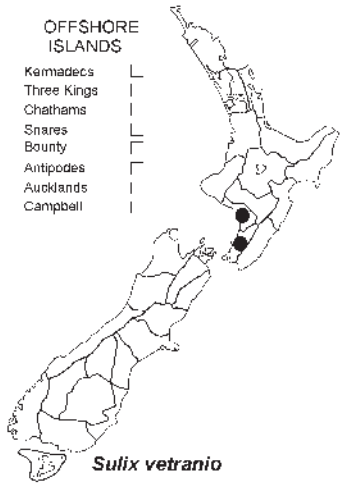
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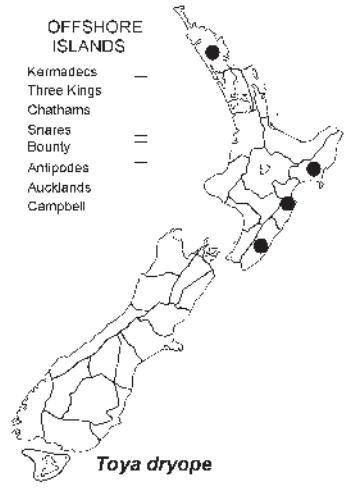
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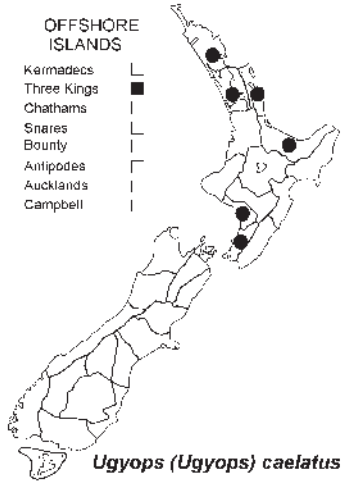
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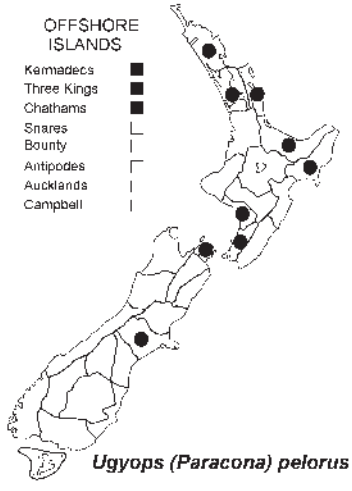
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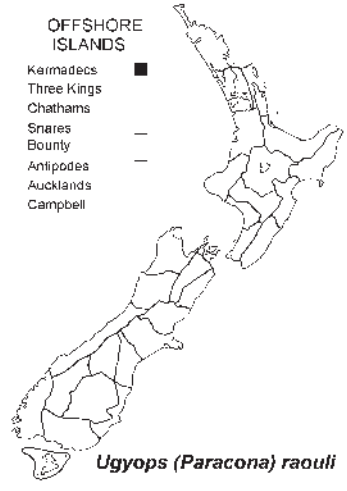
Toya dryope



Ugyops (Ugyops) caelatus

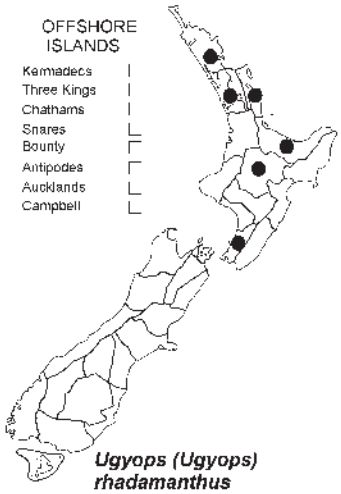


Ugyops (Paracona) pelorus



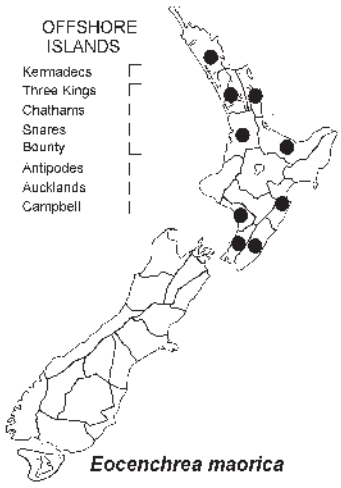
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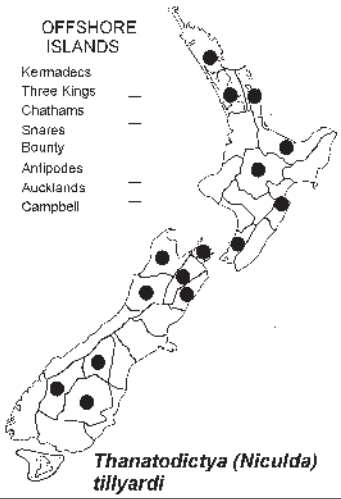
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DERBIDAE



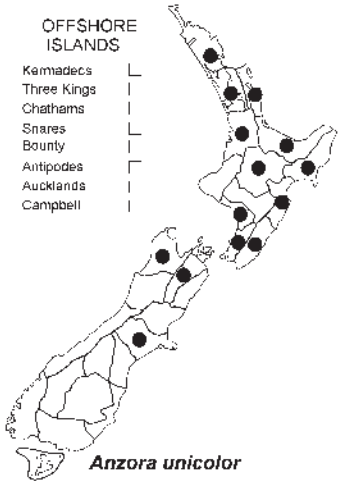
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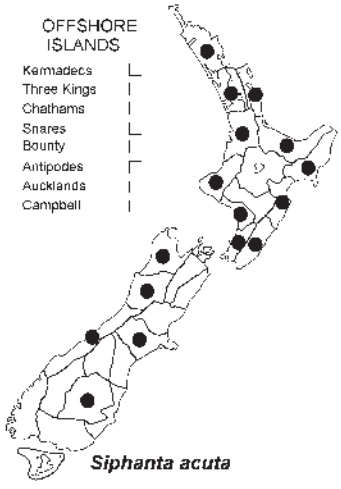


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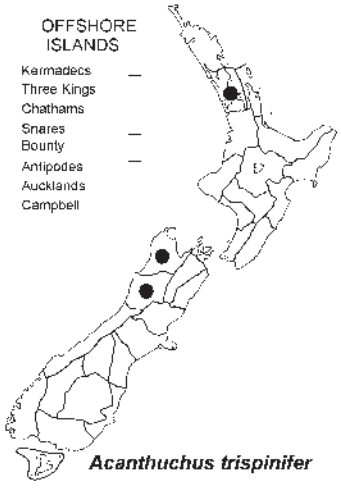


Anzora unicolor



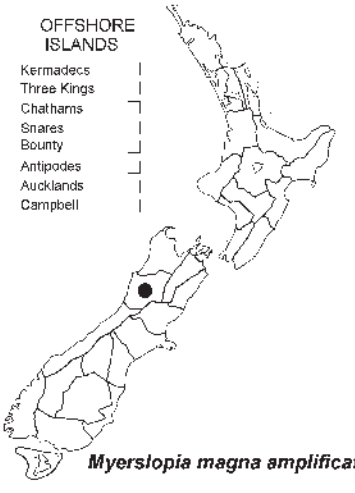
Siphanta acuta

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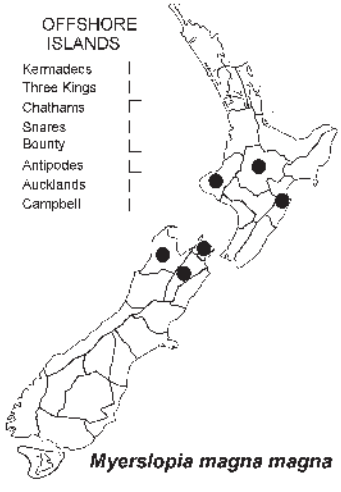


Acanthuchus trispinifer

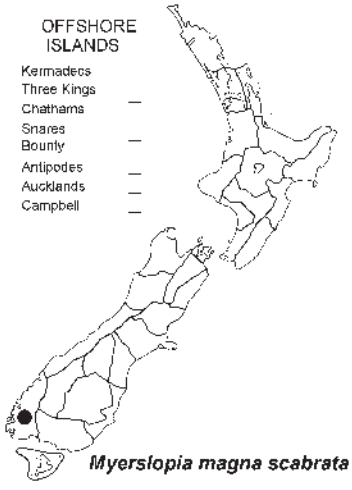
MYERSLOPIIDAE



Myerslopia magna amplificata

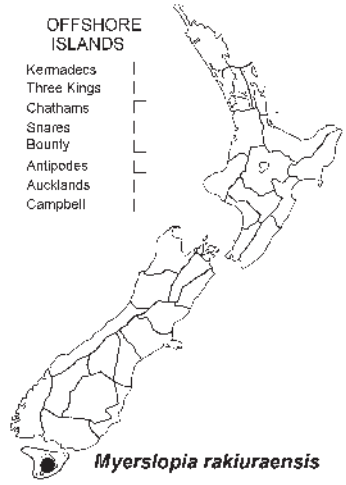


Myerslopia magna magna

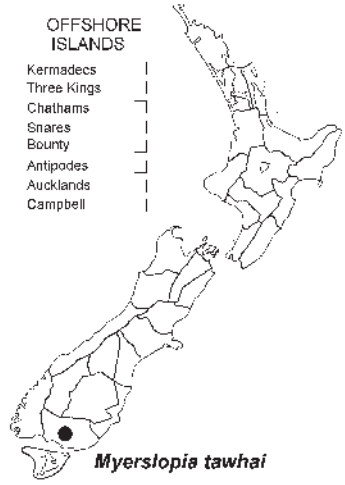


Myerslopia magna scabrata

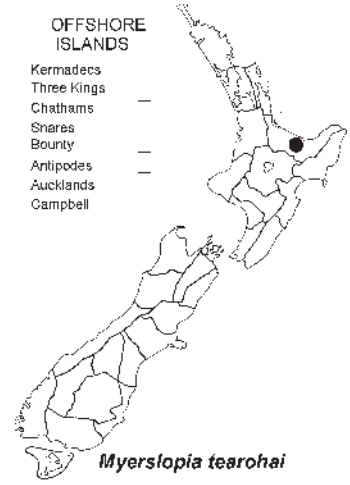
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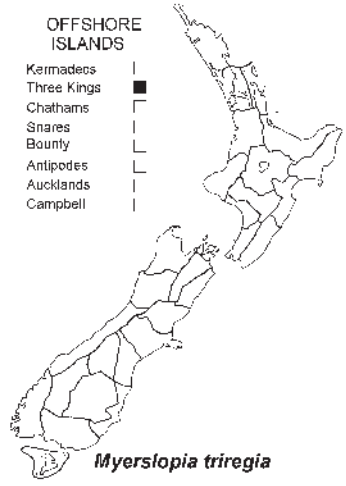
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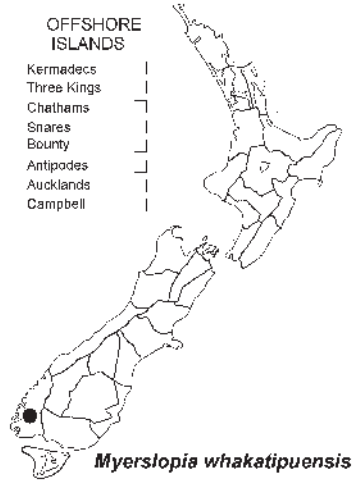
Myerslopia tawhai



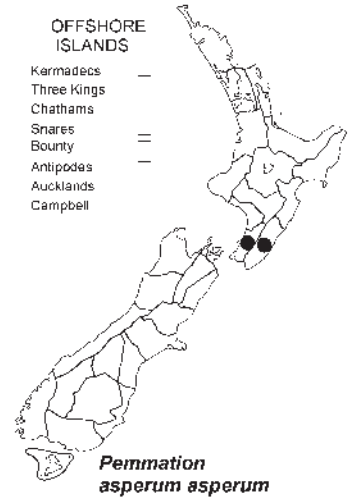
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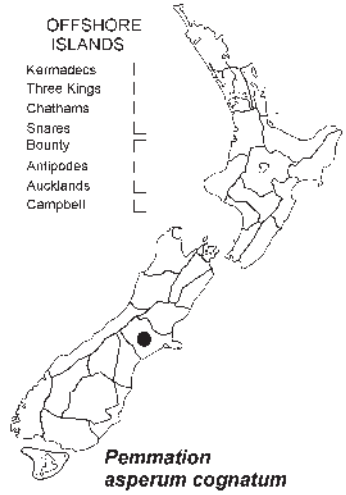
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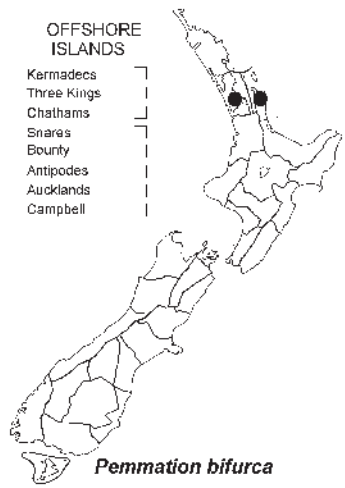
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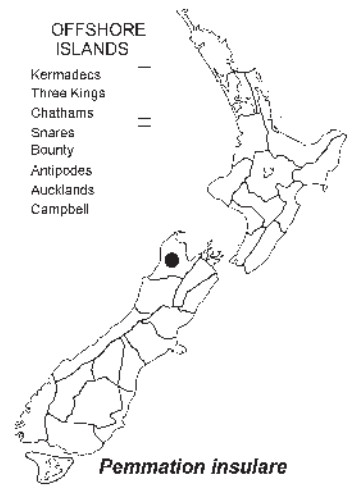
Pemmation asperum asperum



Pemmation asperum cognatum

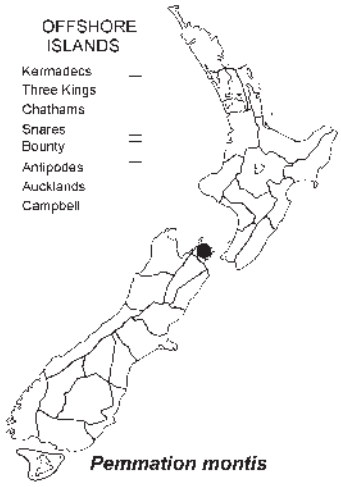


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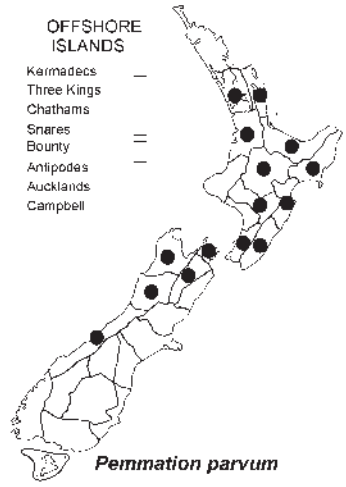


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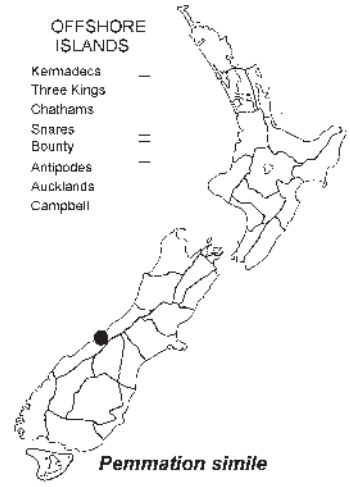
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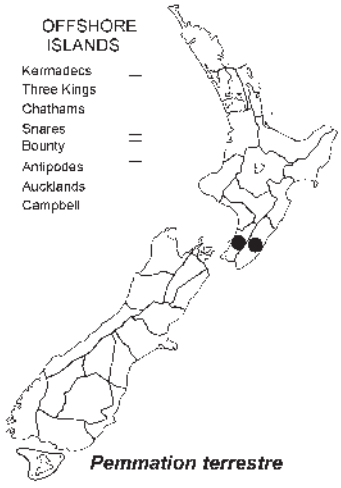
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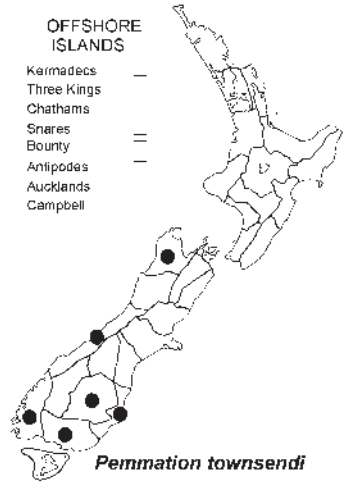
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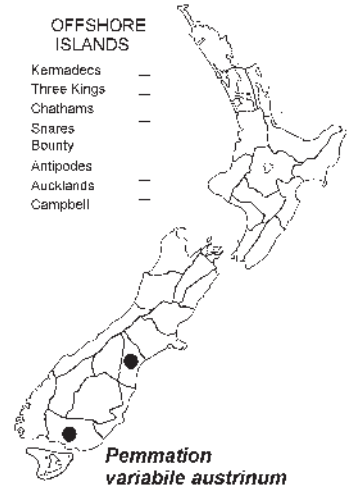
Pemmation simile



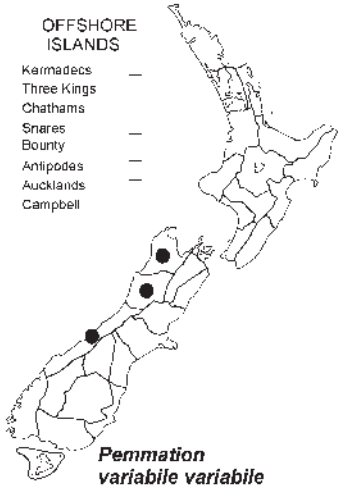
Pemmation terrestre



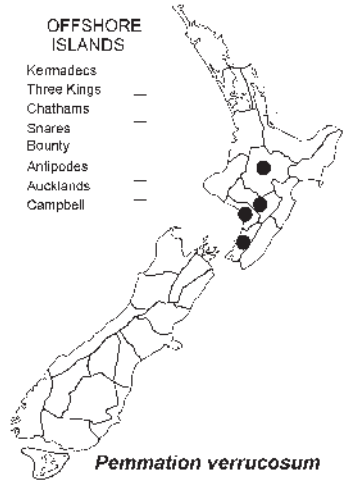
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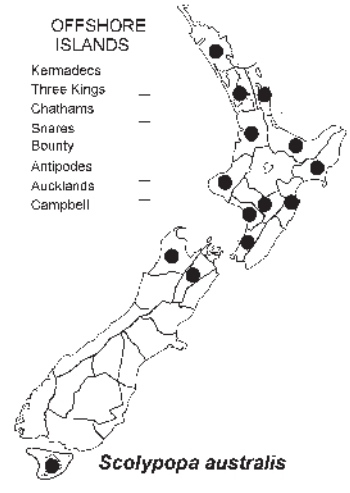


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Pemmation verrucosum

RICANIIDAE



Scolypopa australis

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This index covers the nominal taxa mentioned in the text, regardless of their current status in taxonomy. In the case of synonyms, the combinations of generic and specific names listed are those originally published by authors, and may differ from combinations implicit in current usage. Taxa in **bold** indicate valid taxa. Page numbers in **bold** indicate main catalogue entries. The letter "**f**" after a page indicates a **figure**. The letter "**m**" indicates a **distribution map**. The letter "**p**" indicates a **type photograph**.

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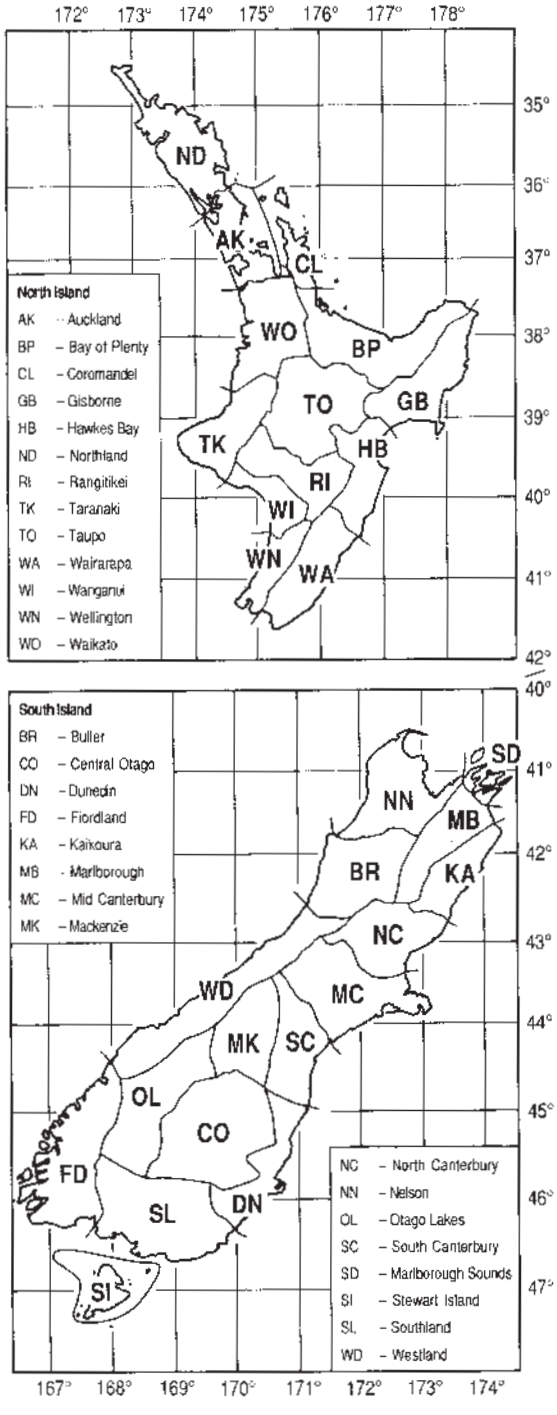
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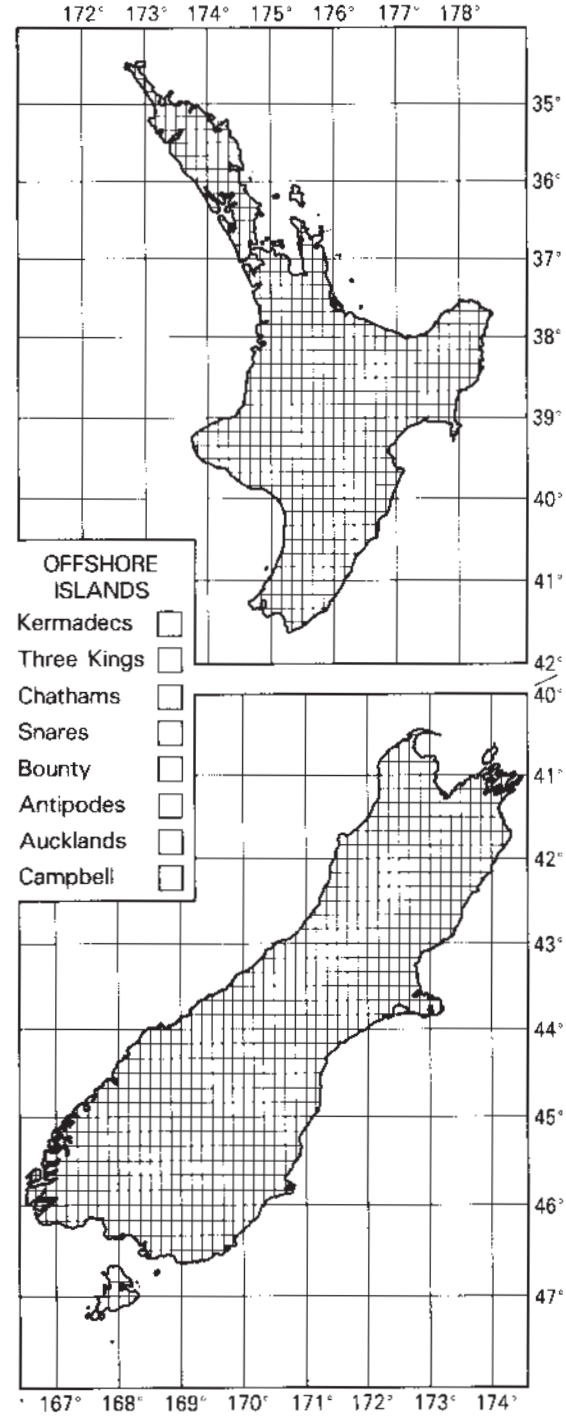
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He titiro whāiti tā tēnei pukapuka ki ngā mea noho whenua, kāore he tuarā; i pēnei ai i te mea kei te mōhio whānuitia ngā mea whai tuarā, ā, ko ngā mea noho moana, koirā te tino kaupapa o te huinga pukapuka *Marine Fauna of N.Z.*

Ka āhei te tangata ki te **whakauru tuhituhinga** mehemea kei a ia ngā tohungatanga me ngā rauemi e tutuki pai ai tana mahi. Heoi anō, e wātea ana te Kohinga Angawaho o Aotearoa hei āta tirotiro mā te tangata mehemea he āwhina kei reira.

Me whāki te kaituhi i ōna whakaaro ki tētahi o te Kāhui Ārahi Whakarōpūtanga Tuarā-Kore, ki te ǵtita rānei i mua i te tīmatanga, ā, mā rātou a ia e ārahi mō te wāhi ki tana tuhinga.

Ko te hunga pīrangi **hoko pukapuka**, me tuhi ki *Fauna of N.Z.*, Manaaki Whenua Press, Manaaki Whenua, Pouaka Poutāpeta 40, Lincoln 8152, Aotearoa.

E rua ngā tūmomo kaihoko: "A" – kaihoko tūmau, ka tukua ia pukapuka, ia pukapuka, me te nama, i muri tonu i te tānga; "B" – ka tukua ngā pānui whakatairanga me ngā puka tono i ōna wā anō.

Te utu (tirohia "Titles in print", whārangi 230). Ko te kōpaki me te pane kuini kei roto i te utu. Me utu te hunga e noho ana i Aotearoa me Ahitereiria ki ngā tāra o Aotearoa. Ko ētahi atu me utu te moni kua tohua, ki ngā tāra Merikana, ki te nui o te moni rānei e rite ana.

E toe ana he pukapuka o ngā putanga katoa o mua. Mehemea e hiahia ana koe ki te katoa o ngā pukapuka, ki ētahi rānei, tonoa mai kia whakahekea te utu. Tekau ōrau te heke iho o te utu ki ngā toa hoko pukapuka.